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The development of children's attention to television at home : the role of commercial content boundaries.

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THE DEVELOPMENT OF CHILDREN'S ATTENTION TO TELEVISION AT HOME: THE ROLE OF COMMERCIAL CONTENT BOUNDARIES

A Dissertation Presented

by

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DEDICATION

This paper is dedicated to John G. Nathan. His continuous pursuit of new challenges was a constant source of inspiration. His love, support and self-less personal sacrifice made it possible for me to pursue challenges of my own.

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The study reported here is part of a larger on-going effort to systematically study families' television viewing behavior as it occurs at home. Conceived and directed by Professor Daniel R. Anderson, this study has been in progress for eleven years. Many people have contributed to the success of this project during that time. Caleb Weissberg designed the equipment installed in the homes. Marina Buckley, Harold Byrd, Diane Field, Catherine Fischer, Elizabeth Lorch, John Nathan, Pearlie Pitts, Robin Smith and others collected all original data including the videotapes analyzed in the current paper. Rex Bradford, Robert Hazen, Peter Lee and Eric Pierce created the computer programs used to code those tapes. Tracey Baptiste, John Burns, Ann Dacey, Joelle Ehmka, Beth Hampton, Oliver Hammerlee, Donna Killalea, Kristin Kirk, Gregory Kurland, Diane Luecke, Jason Nomikos, Ilene Sussman, Elizabeth Tung, and others worked diligently to code the videotapes. Eric Brewer was invaluable in helping to keep laboratory equipment and rating systems running and offered numerous helpful programming suggestions.

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ABSTRACT

THE DEVELOPMENT OF CHILDREN'S ATTENTION TO TELEVISION AT HOME: THE ROLE OF COMMERCIAL CONTENT BOUNDARIES

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Numerous studies have examined the development of children's understanding of and attitudes towards commercials. Few, however, have investigated attentional responses while viewing advertising. One prior study specifically focused on this question. It found that attention to advertising declined with age, and that the difference between attention to ads and surrounding programs increased with age. A handful of laboratory studies, however, have observed higher attention to commercials by older children, and one study found that three-year-olds' (but not older children's) attention to commercials was elevated relative to programming. Thus, it is unclear how children's attention to commercials varies with age.

The current study videotaped 32 two- to twelve-year-old children viewing television at home. Equal numbers of children (half male, half female) aged 2, 5, 7-8, and 11-12

years from different families were observed for 8 to 10 days. The onset and offset of every look at the TV, the beginning and end of every program and advertising block, and the exact timing of every exit from the viewing room were coded. In addition, each broadcast segment was coded as intended for children or adults.

Advertising comprised an average 15.8% of time with television and did not vary significantly as a function of age. Percent attention and the number of exits per hour of programming and commercials were compared. Visual attention to both advertising and programming content increased with age. In both cases the most dramatic increase was between 2 and 5 years of age. Contrary to anecdotal reports, toddlers were no more interested in commercials than in program content. The percent attention and exiting results both indicated that interest in advertising relative to programming declines with age. The results also indicate that children begin to time their exits to occur during advertising before they begin depressing their attention to it. Finally, attention is first depressed within the context of child-oriented content.

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CHAPTER 1

INTRODUCTION

Since the late 1960s parents and other advocates for children have been concerned about the potential impact of television advertising on children. This concern arises in part from the fact that young children are unequipped with the skills necessary to critically evaluate advertising messages (see Adler, Lesser, Meringoff, Robertson, Rossiter & Ward, 1980; Comstock & Paik, 1991; Sheikh, Prasad & Rao, 1974; Young, 1990). Nevertheless, they are exposed to an enormous amount of advertising each year. A recent tally of the ads broadcast between 1983 and 1989, for example, indicated that an average hour of television included between twenty-two and twenty-six product commercials (Scheibe & Condry, 1991). Given that American children spend an average of between fifteen and twenty hours per week with television (Anderson, Field, Collins, Lorch & Nathan, 1985; Huston, Wright, Rice Kerkman & St. Peters, 1990), it can be estimated that they are potentially exposed to as many as 27,000 commercials per year.

The typical form and content of advertising directed at children provides additional cause for concern. The overwhelming majority promote sugared cereals, candy, fast foods and toys. Thus, commercials may pose an especially

potent threat to children's nutritional health. It is also the case that ads aimed at children are frequently comprised of fantasy, animation, and special effects both visual and auditory. These features are used in the hope of maximizing the child viewer's interest in and attention to the advertised product (see Barcus, 1980). As some of these features have been demonstrated to be positively associated with visual attention to the TV (cf, Alwitt, Anderson, Lorch & Levin, 1980; Anderson & Levin, 1976; Calvert, Huston, Watkins & Wright, 1982; Campbell, Wright & Huston, 1987), it would be surprising if they did not achieve the producers' intended effect. Moreover, because these forms are also common to child programming, they may contribute to the very youngest children's difficulty in distinguishing commercials from program segments.

In the more than twenty years since these concerns were first raised, hundreds of studies have examined children's advertising and its effects. While considerable progress has been made in some areas, others have received relatively little investigative effort. One such area is children's attention to advertising. It has been the focus of only a handful of studies. It is not known, for example, whether children systematically leave the room during commercial breaks. Moreover, while it is generally agreed that advertising's appeal declines with age, we do

not know the actual levels of attention that children devote to commercials when they are viewing at home.

This lack of knowledge is unfortunate as it is clear that any true account of children's exposure to ads should include the amount of time they are attentive to them. Moreover, until we know how much attention is devoted to advertising when children are viewing at home, it will be difficult to assess the actual size of laboratory-induced effects (cf, Goldberg & Gorn, 1983). It should also be noted that ads have been estimated to comprise between fifteen and twenty percent of each broadcast hour. Thus, no account of children's television viewing behavior in general can be complete until behavior during commercial breaks is understood.

The study reported here is an attempt to fill some of the gaps in our knowledge about children's attention to advertising. Specifically, it documents the amount of time that children of different ages are exposed to television at home. It also examines what percent of that time they are visually attentive to the TV. Finally, it examines the frequency with which they leave the room during commercial breaks. One could argue that exits from the viewing room, at least in part, reflect children's judgments of the attention-worthiness of television content. Until patterns of exiting and attentional behavior are compared, however,

we cannot know the extent to which this is the case. In sum, the current study aims to document whether and how children's levels of attention, and exiting from the viewing room, vary as a function of whether advertising content is being broadcast.

Prior Research

Empirical work has established that there is a developmental progression in children's understanding of television advertising. Children as young as three or four have been shown to be able to correctly apply the label "that's an ad" at rates higher than one would expect by chance (Levin, Petros & Patrella, 1982; Palmer & McDowell, 1979). Studies which have asked children to explain how commercials and programs are different, however, find that below first grade, the distinction appears to be primarily based on perceptual or coincidental reasons: "they're shorter", or "they're funny". By age seven or eight most children can articulate that advertising is intended to sell. The full appreciation that commercials are therefore likely biased may not be well-established until a bit later, but is certainly evident in the overwhelming majority of middle-school-aged children (Blatt, Spencer & Ward, 1972; Robertson & Rossiter, 1974; Ward, Reale & Levinson, 1972; Ward, Wackman & Wartella, 1977; Wartella, Wackman, Ward, Shamir & Alexander, 1979).

Some more recent work, employing more sensitive testing procedures, has suggested that an at least rudimentary understanding that commercials want to sell something may appear in some children as young as five years of age (Donohue, Henke & Meyer, 1980; Macklin, 1987). This does not mean that they act on that knowledge when viewing commercials. For example, kindergarten and first grade children still report trusting advertising more than older children do. In addition, they evaluate individual commercials more positively, as well. In fact, one study suggests that even ten-year-olds who have a good understanding of the selling intent of advertising, may not automatically call upon that knowledge when viewing individual commercial messages (Brucks, Armstrong & Goldberg, 1988). Thus, even if children as young as first grade have relatively good recognition of the selling intent of advertising, they may not use that knowledge to critically evaluate a commercial while viewing.

As noted above, relatively little research has focused on children's attention to advertising. What little research that has been done, suggests that children's attention to commercials may be influenced by their level of understanding of them. Even less has focused on whether they systematically time their exits from the viewing room to occur during commercials breaks.

Exiting During Commercials

As adult television viewers, most of us could report numerous occasions when we have used a commercial break as an opportunity to leave the viewing room to accomplish other tasks. When especially interested in the program we are watching, we may even choose to delay exiting until the commercial we know is soon to occur has begun. Thus, the degree to which exits are timed to occur during ads likely reflects the viewer's knowledge of the structure of broadcast television, as well as his or her relative interest in ads and the programming they interrupt.

Winick & Winick (1979) observed more than three hundred children viewing television at home. They informally report that most of those children thought that commercials were unimportant. Moreover, they commented that children as young as two frequently left the room during commercial breaks.

Allen (1965) videotaped families viewing television at home. He reports that between 43 and 58 percent of the time that the TV was on and a commercial was being broadcast, viewers were either inattentive or had left the room. Unfortunately, he does not present this data by age.

Ward, Levinson & Wackman (1972) conducted the first and most comprehensive study to date of children's behavior during commercial breaks. They trained sixty-five mothers

to code their child's behavior during six to ten hours of normal viewing over a ten day period. Observations were made just prior to and during every commercial that was broadcast. Behavior during advertisements was coded as being either fully attentive (eyes on the set during "all or almost all" of the ad), partially attentive (child remains seated by eyes are on/off the set), up in the room, leaving the room, or absent from the room at commercial onset.

The data are reported for three age groups: five- to seven-year-olds, eight- to ten-year-olds, and eleven- to twelve-year-olds. The percentages reported represent the percent of all ads coded for all children in an age group. In addition, the total number of ads is comprised of all ads occurring during periods selected for observation. This includes ads during which the child was not in the room. In other words, being out of the room is treated as one of the possible attentional responses to an ad.

The proportion of ads where children left the room after ad onset was low and relatively constant across all three groups: 4 percent for both five- to seven-year-olds and eight- to ten-year-olds, and 5 percent for eleven- to twelve-year-olds. Children were out of the room during 4, 7, and 6 percent of all ads (in order by increasing age). Adjusting for "not in the room" observations (with a

calculator), had little effect on the proportions reported for exiting. According to mothers' observations, then, exiting during an ad was rare. Of course, as mothers didn't code behavior during programming, it is impossible to know if exiting was nevertheless timed to occur during commercials.

Later in the paper it is reported that "...26 percent of the youngest children had left the room or were talking during commercials at the end of the program, compared to 36 percent of the 8-10-year-olds and 47 percent of the 11-12-year-olds" (Ward et al., 1972, p. 503). It is unclear whether these proportions should be interpreted as written (i.e. as percent of children) since all other reported statistics are based on percent of advertisements. Nevertheless, they seem to indicate that older children were more aware that the program had ended and they used the commercials which followed as an opportunity to leave the room. The proportion of all ads that were coded as talking, however, varied considerably with age. It is possible, then, that while the older children were less attentive to ads at the end of programs than younger children were, they may not have left the room with any more frequency.

In sum, despite our intuition that at least adults time their exits to occur during commercials, we have no

data to verify that this is the case for them or for children. If the timing of exits does reflect a viewer's relative interest in ads versus programming, we should expect to see developmental patterns similar to those reported when attention to advertising has been observed. What follows is a brief review of the handful of studies that have examined that behavior.

Attention to Commercials

One of the earliest reports of children's attention to commercials was provided by Bechtel, Achelpohl & Akers (1972). They videotaped the viewing rooms of twenty different families over a period of six days. Whenever the television was turned on, videotape recorders in a van outside the home would begin to record in real time. These tapes were then coded in 2.5 minute intervals. In other words, the coder would characterize each viewer's level of attention, as well as what was being viewed, during each 2.5 minute segment of TV "on time". All intervals that were at least partially attended were labeled as "watching".

Children aged 1 to 10 years were watching during 41.5 percent of the intervals when they were in the room and a commercial was being aired. The same figure for 11 to 19 year-olds was 55.8 percent. Watching during programming is broken down by type of show. Thus, it is difficult to know

with certainty whether either age group watched commercials more or less than programming content. It can be said, however, that the difference between percent watching for commercials and percent watching for TV in general was a bit larger for the older group. Thus, Bechtel et al.'s data suggest that while the incidence of watching TV (including ads) increases with age, the appeal of ads relative to programming declines.

Ward et al. (1972) in their study of five- to twelve-year-old children come to a somewhat different conclusion. As described earlier, they trained mothers to code their child's behavior during the period just prior to, as well as during, commercials. They report that the proportion of ads that were fully attended varies as a function of age. The 5 to 7 year-olds, 8 to 10 year-olds, and 11 to 12 year-olds were fully attentive to 50, 46, and 33 percent of all ads, respectively. When partially attended commercials are included, the figures are 66, 68, and 58 percent. Thus, twelve-year-olds fully attended a smaller proportion of ads than either of the younger groups. This age difference remains (though it is somewhat attenuated) when the criterion includes viewing of any level. This seems to contradict the pattern reported by Bechtel et al. (1972).

One might attribute the difference in findings to the difference in the range of ages included in their younger

and older groups. If this is the case, then there must either be an increase in attention to advertising after age eleven or twelve, or extremely low attention to advertising below age five. The former seems unlikely, as attitudes toward advertising have been shown to become increasingly negative, particularly after age eight (Linn, de Benedictis & Delucchi, 1982; Robertson & Rossiter, 1974; Ward et al., 1977). In support of the latter possibility, two studies have found that systematic attention to the TV does not begin until between two and three years of age (Carew, 1980; Anderson & Levin, 1976).

In any case, the findings are more consistent when attention during commercials is compared to attention during program content. Ward et al. (1972) report that the incidence of full attention during commercials was lower than that to just-prior programming for all three age groups. The differences were 8, 12, and 17 percent in order by increasing age. Thus, while all children appeared to pay less full attention to ads than programming (at least just-prior programming), the degree to which this was the case increased linearly as a function of age.

The size of the difference between attention to ads and programming was not constant across all types of viewing. Ward et al. (1972) examined patterns of full attention during Saturday mornings (6 a.m. to 1 p.m.) and

weekday evenings (6 p.m. - 1 a.m.), the rough equivalent of child and adult programming. The three age groups were collapsed into two for this analysis: 5 to 8 year-olds and 9 to 12 year-olds. The younger group showed a greater difference in the incidence of full attention to ads versus just-prior programming during Saturday morning viewing (17 percent difference) than during weekday evenings (11 percent difference). This was true when partially attended intervals were included as well. In fact, the younger group shows almost no differentiation in attention to weekday evening ads and program content when both partially and fully attended intervals are considered together. Thus, it appears that younger children are especially sensitive to advertising during Saturday morning viewing.

There are a number of possible explanations for this effect. It is possible, for example, that while much of child programming is understandable to young children, advertising content may be less so. Alternatively, this may reflect a phenomenon reported when researchers have attempted to determine what experience is responsible for children developing an awareness that advertising is often misleading. Namely, when asked how they know why ads are not always truthful, most children report that it is based on personal experience with products they saw advertised on TV (Rossiter & Robertson, 1974; Ward et al., 1977). As

this is most likely to occur for products advertised during children's programming their distrust of commercials, and negative attitudes towards them, may first arise in this context.

The same was true of the older group, but only when both fully and partially attended intervals were considered together. Specifically, the incidence of full attention was low for both ads and just-prior program content during Saturday mornings (38 percent for just-prior intervals, 33 percent for commercials). The proportion of observations that were coded as partially attentive, however, was especially high for just-prior intervals (31 percent versus 21 percent for commercials). Thus, this group devotes little full attention to the TV in general on Saturday mornings but they are still more likely to look at least some of the time during intervals just-prior to ads than during intervals of commercial content. During weekday evenings, attention was greater during just-prior intervals than during commercials, regardless of whether attention was indexed as fully attentive or as at least some looking. In sum, it appears that the older group is sensitive to ads whether they occur during Saturday mornings or weekday evenings. The younger group may be as well, but their preference for programming is especially high when viewing Saturday morning programs. Differentiating attention to

ads and just-prior programming, then, appears to vary jointly as a function of both age and type of program content.

One final set of results reported by Ward et al. (1972) are of interest to us here. Besides coding attention, mothers also coded verbal reactions both at ad onset and during the commercial itself. As was already noted, the younger two groups of children tended to talk during a smaller proportion of ads than the eleven- and twelve year-olds. Despite this, they were somewhat more likely to make comments about an ad or the product it was promoting than the oldest children were. Positive comments during commercials were more frequent in these groups than they were for eleven- and twelve-year-old children, as well. Reactions at commercial onset were not common but were more likely to be positive than negative, especially in the two younger groups of children.

To summarize Ward et al.'s (1972) findings, attention to programs is greater than that devoted to commercials. Moreover, the difference between the two increases with age, especially after age eight. In addition, younger children show a stronger preference for programming during Saturday mornings than during weekday evenings. Nine to twelve-year-olds prefer programming during all types of viewing that were examined. Finally, though Bechtel et

al.'s (1972) data disagree, the actual level of attention to commercials appears to drop considerably between eight and eleven years of age. Analysis of verbal comments made while viewing suggests that older children not only prefer programming (as the younger subjects do), they also have somewhat more negative attitudes toward advertising than children in younger groups.

While these results are compelling, little work has been done to verify these findings. Most of the other research in this area bears more directly on the issue of attitudes and the development of children's understanding of the purpose of commercials than on age-related trends in the visual attention that is accorded to them. While these issues are clearly relevant, the patterns of attention identified by Ward et al. (1972) should be verified by additional research. Specific limitations of the Ward et al. (1972) study are considered below.

First, it is unclear if behavior just prior to commercials is indicative of behavior throughout program segments. It is possible, for example, that attention just before commercials is lower, especially in older children, as they may be able to predict that a commercial is coming up. Alternatively, as program plots often build to a climax just before ads, attention may be higher than is indicative of that devoted to programming in general.

Another potential problem concerns the fact that the data are based on samples of viewing selected by mothers. While mothers were instructed to choose a representative sample of the programming their child normally viewed, nowhere in the report is there an evaluation of how successful mothers were at doing this. Thus, it is possible that the representativeness of the samples varied for the different age groups. A case in point is the fact that 41 percent of the observations for the 11 and 12 year-olds were made during child shows and movies. This may over-represent their actual exposure to this type of programming. Ward et al.'s Saturday morning analysis suggests, moreover, that this content is less interesting to them than weekday evening (adult) content - both in terms of advertising and programming.

Another potential problem with the representativeness of Ward et al.'s (1972) data, concerns the fact that all viewing by necessity had to occur with at least one adult (Mom) in the room. We know that the presence of coviewing peers alters the pattern of when preschool children look at the TV, at least in a laboratory setting (Anderson, Lorch, Smith, Bradford & Levin, 1981). In addition, there is some evidence to suggest that coviewing with parents occurs much more frequently for some kinds of content than others, and that the amount of coviewing, in general, changes with age

(Dorr, Kovaric & Doubleday, 1989; St. Peters, Fitch, Huston, Wright & Eakins, 1991; Wright, St. Peters & Huston, 1990).

Atkin (1975a) observed over two hundred children's reactions to seven commercials (embedded within a 20 minute videotape of cartoons and news) that were viewed in a laboratory setting. Two age groups were studied: three-to seven- year-olds (but primarily kindergarten and first graders) and eight- to ten-year-olds. Visual attention and affect were coded for each of fourteen 30 second intervals. Attention codes ranged from no attention (0 to 1 second) to full attention (29 - 30 seconds). Enjoyment and irritation were coded as low, medium, and high.

Contrary to Ward et al.'s (1972) findings, older children in this study exhibited significantly and consistently higher levels of attention to advertising than the younger children did. The commercial receiving the lowest average attention and the highest irritation scores (especially among the younger group) was the single adult-oriented ad. Moreover, while level of enjoyment was equivalent across groups, the younger children displayed significantly more irritation during the commercials than the older children did. This, too, seems to disagree with what mothers reported in Ward et al.'s (1972) study. There, negative comments were more frequent for older

children, especially when viewing on Saturday mornings. It is possible that this difference is attributable to older children wanting to exhibit more socially appropriate behavior in a laboratory setting.

In a later study Atkin (1975b) interviewed 700 four to twelve-year-old children. When asked to rate how much they liked three different ads, younger children responded more positively than older children. Nevertheless, sixty percent of the youngest group (preschool and kindergarten children) reported that they were irritated by commercial interruptions while viewing. Older children reported being even more irritated. Thus, while young children may like individual ads, they report being frustrated by the fact that they interrupt the on-going program that they are viewing. Since children seem to only exhibit this irritation in the laboratory, it may be ameliorated when toys and other alternative activities are available to the child.

Approximately half of these children's mothers were also interviewed (Atkin, 1975b). One of the questions asked was whether their child paid close, some, or little attention to commercials when they viewed at home. The percent of mothers reporting "close" was relatively constant for the kindergarten/preschool and first/third grade groups (59 and 54 percent, respectively). Only 29

percent of the mothers of fourth and fifth graders, on the other hand, thought their child paid close attention to commercials. This pattern is similar to the one that Ward et al. (1972) reported for "fully attentive" responses. When mother-report measures are used, then, the pattern of increasing attention to commercials observed in the laboratory is reversed.

Zuckerman, Ziegler & Stevenson (1978) also observed children viewing commercials in a laboratory setting. They exposed 112 second, third, and fourth grade children to eight cereal advertisements embedded within either a live or animated program. A larger proportion of younger children were looking during an average second of both programming and commercials than was true for older children. Moreover, the difference in the proportion of children who looked at ads versus the proportion who looked at programming decreased with age. As only 15 percent of the oldest children were attentive, on average, during program content, there wasn't much room for a decline in the presence of commercials. Apparently, the content used in these stimulus tapes was not very compelling for children in the two older groups. Zuckerman et al. (1978) also report that while some commercials were attended by significantly more children than others, all showed a pattern of declining interest as the commercial progressed.

Wartella & Ettema (1974) examined nursery school, kindergarten and second grade children's attention to twelve different commercials embedded between segments of "The Partridge Family". The commercials differed from one another with respect to their relevance to children (i.e. food commercials versus ads for adult products), as well as the degree of perceptual complexity in their visual and audio tracks. In other words, the amount of visual and auditory change varied across commercials.

The primary purpose of the investigation was to determine whether the influence of perceptual characteristics on attention varied as a function of age. The authors hypothesized that younger children would be more influenced by this manipulation than would older children. The idea was that as children moved closer to reaching Piaget's formal operational level of thinking (roughly equivalent to being able to represent and manipulate abstract concepts), their attention to the television would become increasingly more focused on the conceptual (rather than perceptual) information available in the advertisement.

A similar hypothesis had been offered as an explanation for the results of earlier work examining age-related differences in children's understanding of, and memory for, commercial content. When asked how commercials

and programs were different (using open-ended questions), for example, five-to seven-year-old children were more likely to mention perceptual characteristics (such as commercials are short). In addition, open-ended recall questions typically elicited references to discrete visual images such as an object, a character or a brief action sequence. Older children, however, were more likely to refer to the concept that commercials are intended to sell. Moreover, their recall was more complex and evidenced a more integrated representation of the content presented. Thus, young children appear to be more stimulus (or perceptually) bound, in their thinking about commercials than older children (see Blatt et al., 1972; Robertson & Rossiter, 1974; Ward, Reale & Levinson, 1972; Ward et al., 1977).

Wartella & Ettema (1974) coded children's attention as full, partial or none during each 10 second interval of commercial content. The 10 seconds just prior to, and the 10 seconds just after each commercial were coded as well. Attention scores were weighted (more for full attention, less for none) and averaged across all intervals for each commercial within each group.

Children in all groups tended to shift attention toward the TV at commercial onset. Thus, even three-year-olds were capable of detecting the change from program to

commercial content. The predicted age by stimulus complexity interaction was only significant in the context of relevant commercials. The difference in attention to high and low complexity ads was greatest for the nursery school children, and close to zero for the two older groups. Auditory complexity seemed to be the primary source of this effect. It is possible, then, that the auditory change introduced at commercial boundaries is what caused the shift in attention toward the TV at these points. Attention to commercials, in general, was lower for nursery school children than for either of the two older groups. Finally, children's memories of, and attitudes toward these ads were analyzed. It confirmed what the earlier work had found. The proportion of comments revealing a conceptual (or more abstract) level of analysis of commercial content increased with age. In sum, Wartella & Ettema's (1974) data tell us that while even three year-olds may perceive a change in content at commercial boundaries, it is probably the case that what is being detected is a perceptual (auditory) change rather than some recognition that a "commercial" is on.

One might infer from this study that children's attention to television is primarily driven by the amount of perceptual change it presents. In fact, this was a central component to most early theoretical accounts of

children's attention to television in general (Emery & Emery, 1976; Lesser, 1977; Singer, 1980). The idea was that because television is a perceptually complex, constantly changing, and often novel stimulus, it was repeatedly eliciting an orienting response in young children. This reflexive theory of children's attention to television has been the subject of numerous empirical investigations.

The results of the studies focused on this question have determined that children's attention to television is elevated in the presence of some attributes (such as children's voices, scene changes, and animation) and depressed in the presence of others (Alwitt et al., 1980; Anderson & Levin, 1976; Calvert et al., 1982). The number of these characteristics that reliably influence attention to the television increases with age. Moreover, as Wartella & Ettema's (1974) results suggest, auditory characteristics of television content not only appear to be more powerful in influencing attention than are visual ones, they are responded to by children as young as two and one half years of age. Additional research suggests that these characteristics derive their power to elicit and maintain attention from the fact that they tend to co-occur with content that is likely to be comprehensible and interesting to children (Anderson, Lorch, Field & Sanders, 1981; Krull & Husson, 1979; Lorch & Castle, in press).

Thus, while auditory change may elicit a look from an inattentive child, he or she is unlikely to continue looking if the material being presented is incomprehensible to him or her.

One of the studies contributing to this body of literature included commercials as part of the stimulus tapes (Alwitt et al., 1980). The attention of 60 three-, four-, and five-year-old children was continuously coded while they individually viewed in a laboratory setting. Percent attention, in general, increased with age. Unfortunately, the level of attention to commercials was not reported for the separate age groups. For the sample as a whole attention to commercials was approximately 36 percent. As Wartella & Ettema (1974) found, the onset of a commercial tended to elicit looking from inattentive children. Attention was not maintained, however, as the presence of commercials was generally associated with depressed levels of attention, at least in the two older groups. While both four- and five-year-olds exhibited this effect, it was more pronounced in the older group. The three-year-olds, however, showed the opposite pattern, paying more attention to commercials than to program content. The only other characteristic that showed this pattern was lively music. It is possible then, that the commercials incorporated more lively music than program

segments. If so, the pattern of results for commercials may have been another example of the effect that Wartella & Ettema (1974) found for auditory complexity. In any case, as this is the only study to report this finding more investigation is clearly warranted. Finally, Alwitt et al. (1980) also observed, as Wartella & Ettema (1974) did, that commercial onsets elicited viewing in inattentive viewers of all ages.

Summary and Predictions

A review of the literature examining children's attention to advertising reveals a number of consistent findings. Most can be explained by the hypothesis that children's attention to commercials is in large part determined by the development of their understanding of the purpose, and likely credibility, of advertising. Three studies compared attention to commercials with attention to program content. All three found that children preferred to look at program content (Alwitt et al., 1980; Bechtel et al., 1972; Ward et al. 1972). Moreover, the degree to which this was the case increased with age in all three studies. One study compared the size of this effect for content aimed at children versus that aimed at adults (Ward et al., 1972). It suggested that this effect may occur for younger children only when viewing programs intended for their age-group. This too may be consistent with the

development of children's understanding of advertising's likely credibility, as this awareness seems to arise as a result of personal experience with advertised products.

An exception to the pattern of greater interest in programming than commercials was reported by one study. Alwitt et al. (1980) found that three-year-olds exhibited elevated levels of attention during advertising content. This may have been due to the auditory complexity introduced by lively music, which would be consistent with Wartella & Ettema's (1974) work.

The pattern of results was less consistent when researchers examined the level of attention devoted to commercials as a function of age. When estimates were based on reports provided by mothers, attention to commercials was found to decrease with age, especially after age eight (Atkin, 1975b; Ward et al., 1972).

When observed in a laboratory setting, however, older children paid more attention to commercials than younger children did (Alwitt et al., 1980; Atkin, 1975a; Wartella & Ettema, 1974). It is possible that this pattern was due to older children altering their behavior to comply with perceived experimenter demands.

However, a pattern of attention to advertising increasing over the early preschool and middle school years, is entirely consistent with the comprehensibility

hypothesis of attention to television in general. It is known that children's comprehension of television narratives increases throughout the preschool and elementary school years such that by third grade children are capable of understanding much of an adult television drama, although they misunderstand some of the adult themes and actions. By age twelve or thirteen comprehension reaches near-adult levels (see Collins, 1982 and 1983 for reviews). Moreover, percent attention to television in general has been found to follow a similar developmental path (Anderson, Lorch, Field, Collins & Nathan, 1986; Levin & Anderson, 1976) and is generally believed to reflect the increasing comprehensibility of the content (Anderson & Lorch, 1983; Huston & Wright, 1983; Huston & Wright, 1989). Thus, it is possible that attention to advertising also increases with age as children's comprehension skills improve. Simultaneously however, children are also becoming more aware that commercials are likely biased. The net effect is a pattern of increased attention to commercials with age, accompanied by an increasing preference for program content. Clearly this issue (i.e. are increases in attention real or only an artifact of the laboratory viewing situation) could be resolved by research documenting children's actual levels of attention to advertising and program content as they view at home. As

stated in the introduction to this paper, documenting actual levels of attention to advertising at home is also important if we are to assess the actual size of laboratory induced effects.

The study reported here does document, for the first time, children's actual levels of attention to commercials. Moreover, it avoids all of the possible sample bias problems that Ward et al. (1972) may have encountered. In addition, this study directly tests whether the degree to which children avoid ads is influenced by the intended audience of surrounding programming. Finally, it also documents whether children's exiting from the viewing room follows a pattern of increased avoidance of ads with age.

If children's attention to advertising is jointly determined by both the comprehensibility of television content, in general, and the level of awareness of advertising's persuasive intent, a number of predictions can be made about the pattern of results that should be obtained. We would expect, based on the comprehensibility account of children's attention to television, for example, that percent attention should increase dramatically over the preschool and elementary school years. Increases after age eight are likely to be small.

In addition, we would expect that percent attention to adult content should increase continuously with age. By

the same token, percent attention to child content should increase through age five, and perhaps decline in the middle school years. It should be noted that since little, if any, television content is likely comprehensible to two-year-olds, their attention is unlikely to vary as a function of whether adult or child content is being aired.

When percent attention to advertising is compared to attention during program content, a preference for program content should emerge. Moreover, if children's understanding of and attitudes toward commercials is driving this behavior, the magnitude of the difference should increase with age. Finally, if two-year-olds' attention is being reflexively drawn to the television, they should show the opposite pattern. That is, two-year-olds' attention to advertising should be greater than that devoted to program content. If on the other hand, comprehension processes are driving their attention, we should see no preference for either advertising or programs. Again, neither is likely to present much that is comprehensible to two-year-old children. Finally, the preference for program over advertising content is likely to first appear within the context of child content.

When rates of exiting the room are compared, similar developmental patterns should emerge. Two-year-olds, for example, should exit the viewing room no more frequently

per hour of exposure to programming than advertising content. Eleven-year-olds, on the other hand, should show evidence of timing their exits to occur during commercial blocks. In general, exiting rates should be relatively high where attention was predicted to be relatively low.

CHAPTER 2

METHOD

Data for this study were collected in 1980 and 1981 in the Springfield, Massachusetts metropolitan area and are part of a larger ongoing study of five-year-old children and their families' television viewing behavior at home. Detailed descriptions of the families as well as the methods used to collect the data can be found in Anderson et al. (1985) and Anderson et al. (1986).

Subjects

Subjects were 32 children, eight at each of four different age groups (four male, four female). The four ages included were 2-year-olds, 5-year-olds, 7- to 8-year-olds, and 11- to 12-year-olds. These ages were chosen to maximize the possibility of direct comparison with earlier work (e.g. Alwitt et al., 1980; Anderson et al., 1981; Calvert et al., 1982; Levin & Anderson, 1976; Ward et al., 1972), and to enable examination of the development of attention to commercials over the full range of ages during which television comprehension is known to improve. The design of the original study recruited families based on the presence of a 5-year-old, all of whom were within one month of their fifth birthday at the time of recruitment. All other children in the current study are siblings of

such five-year-olds. There is considerable more variability in age within the other three age groups.

We know that the pattern of looks at the TV (at least for preschoolers) is influenced by the presence of other viewers in a laboratory setting (Anderson et al., 1981). Moreover, viewing diary data suggest that the types of programs that children are exposed to is influenced by the existence/absence of older/younger siblings (Huston et al., 1990; Pinon, Huston & Wright, 1989). Therefore, each of the subjects was drawn from a different family. No subject was an only child. Every attempt was made to select children from similarly sized families. In fact, each subject had on average 2 siblings. An age by sex ANOVA on number of siblings revealed no significant main or interaction effects (all p's > .123). Additional selection criteria were that 1) a majority of the potential viewing area in the TV room was covered by the camera and 2) the subject was in the viewing room for a minimum of three hours over the ten-day observation period.

The ninety-nine families from which the thirty-two subjects were drawn are predominantly white, two-parent, and middle-class with sixty-three percent of the mothers being full-time homemakers. As reported in Anderson et al. (1985), comparisons between these families and various control groups revealed no systematic differences in

demographics or attitudes toward TV. In addition, at least for the five-year-olds, the amount of viewing did not appear to be affected by the presence of the cameras.

Equipment Placement and Operation

Recording equipment was always placed in the primary TV viewing room. In addition, families with multiple television sets had recording equipment also placed in any other room where the five-year-old was known to view. Seven of the thirty-two subjects in the current study were from homes where two viewing rooms were videotaped. Earlier analysis of concurrent diary records indicated that these procedures were effective in recording an average 89 percent of the 99 families' TV "on" time (Anderson et al., 1986).

Each recording set-up consisted of two cameras, control circuitry, a time/date generator, a screen splitter, and a time-lapse videodeck. All of the equipment, except for the cameras, were housed in a metal cart. One camera was equipped with a wide angle lens and was used to record the viewing room. It was placed in a position that would both maximize the proportion of the viewing room captured by the lens and always included the area that parents had indicated was the five-year-olds' favorite viewing spot. As will be seen in the results section, this made rating five-year-olds attention to the

TV considerably less difficult than it was for other family members. The second camera was focused on the television set and provided an image of what was being viewed when the television set was on.

Each time the television set was turned on the videodeck would commence continuous recording (video only) at a rate of approximately one videoframe every 1.2 seconds. The image from the wide angle lens was continuously recorded throughout each viewing session. In addition, every 18 seconds a 6 second recording of what was currently on the television was inserted into the lower right hand corner of the video image. We refer to these six second images as "inserts". Finally, the current date and time (to the nearest second) were super-imposed on each videoframe of the tape. Recording continued until the television was turned off or until a light signaled the parent that it was time to change the tape. These signals occurred after approximately 26 hours of television-in-use time. The videotapes, then, provide a visual record of the behavior that occurred in the room whenever the TV was on, as well as a frequent sample of what was being broadcast, and a continuous record of the date and time.

Rating Apparatus

In order to determine whether, and to what extent, advertisements co-occurred with viewer presence in the room

and looking at the TV, it was necessary to create a continuous record of exactly where on the tape each of these events occurred. This was accomplished via the use of a rating apparatus specifically designed for this purpose. It takes advantage of technology which permanently labels each videoframe on a tape with a unique number known as "timecode".

Briefly, two types of timecode, VITC (vertical interval timecode) and longitudinal (according to a standard developed by the Society of Motion Picture and Television Engineers) were used. Longitudinal timecode stores a unique number for each videoframe on that portion of the tape that is devoted to audio information. VITC, on the other hand, is a video-encoded form of timecode, which is recorded in the vertical interval between frames. Because longitudinal timecode is an audio signal, changes in the videoframe number cannot be detected via this channel when the tape is moving below a minimum rate of speed. VITC, however, can be read at any tape speed where it is possible to display an accurate video image, including still frame. As most VCR users are aware, moving the tape at an extremely fast rate of speed distorts the video image. Thus, when the tape is moving very quickly the timecode reader/generator opts to read the longitudinal signal; at speeds slower than normal play it opts for the

VITC signal instead. Since both forms of timecode have encoded the same unique number for each videoframe the timecode reader/generator is always able to report exactly which videoframe is currently being played.

In addition to the timecode reader/generator, each rating system apparatus included a microcomputer, a Panasonic Super-VHS videodeck, a black and white video monitor, a deck-control/rating panel, and a computer console with keyboard attached. The equipment was connected, and the microcomputer programmed, in such a way that the rater was able to sit in front of the video monitor and computer console in one room and control movement of the tape (in another room) via the deck-control/rating panel. A separate set of buttons on the deck-control/rating panel was used to signal the computer when events-to-be-coded were being observed. When one of these buttons was pressed the microcomputer was instantly signalled to store (in memory) both the number assigned to the button and the timecode number for the videoframe currently being displayed. If additional information was required to complete the rate (for example, the name of the television program) the user was queried for that information. It, too, was stored along with the button number and timecode. The microcomputer continuously monitored the current timecode via an electronic signal

from the timecode reader/generator (which was connected to the videodeck). The computer also continuously monitored the deck-control/rating panel and the keyboard for input.

Rating Procedure

Any attempt to simultaneously rate when entrances, exits, programs, commercials, and periods of viewer attention occurred would be error-prone and difficult, if not impossible. This problem was solved by making three separate rating passes through the tapes. A different computer program, with a user interface designed specifically for the demands of each pass, was employed.

First Pass Rating

The first pass through the tapes involved identifying those videoframes where individual viewers entered and exited the viewing room. A separate rating button (hence, code) was used to designate the presence of each family member. When the father entered the viewing room, for example, the rater pressed and released the rating button assigned to the father. The same button was pressed and released when the father exited the viewing room. Each of these actions caused the computer to record the timecode when the button was pressed along with the code for father in this family. It is possible to distinguish between entrances and exits in the first pass data files, as the former were coded with positive integers, the latter with

negative ones. The exact videoframes where the television was turned on and off were also identified during this pass, along with the date and time associated with those events.

It should be noted that every effort was made to place the cameras such that the entire viewing room was captured by the wide angle lens. Unfortunately, however, this was not always possible. Incomplete room coverage was primarily caused by the physical layout and/or dimensions of the viewing room, and the criterion that the five-year-old's favorite viewing location be covered. Under such conditions, it becomes possible (in principle) for raters to confuse exits from the room with movements to areas within the room, but beyond the area covered by the camera. To minimize such errors, maps of the viewing rooms were drawn to scale at the time of camera placement. The maps included (and labeled) all furniture in the viewing room, as well as all possible points of exit/entry. Although it is impossible to directly test, it is our sense that these procedures made confusions about exits a rare event.

The first pass data were put to several uses in the current study. They served as master maps to the video tapes. With such "maps", it was possible to program the computer to automatically zoom (move at high speed) to those videoframes where areas to be rated began, skipping

past those areas that were of no interest (e.g. when the viewer whose attention was to be rated was not in the room). The time/date records from first pass rating were used to derive the exact speed of recording (i.e. number of seconds that elapsed between videoframes) for each viewing session. This was used to convert the duration of any rated event during that session (e.g. a look) from the number of videoframes it endured to the number of seconds in "viewer time". Finally, the timecode records of when exits occurred were obviously critical to the current study.

Second Pass Rating

The goal of second pass rating was to create a continuous record of what was being broadcast on the television. In practice, the computer read the first pass data file and zoomed the videotape to the frame where a TV session began. It then paused the videodeck, queried the rater for information about what was being broadcast on the television, and then turned control of the videodeck over to the user. The rater then played the tape at whatever speed he or she deemed necessary to accurately identify program changes and commercial block boundaries.

Different rating buttons (hence, codes) were used to designate whether the content being viewed was a program, a commercial, or what we have called an "educbit". Educbits

were defined as brief segments of informative content that occurred either between shows or between segments of an on-going program. Examples of educbits include newsbriefs, "School-House Rock", and "In the News". No distinction was made between commercials within a block (i.e. only the onset of the first ad and the offset of the last were coded). Program promotions were considered commercial content.

Separate codes were employed to distinguish between program segments that were a continuation of a program already in progress (after an ad or educbit) and those that were the first of a different show. If the current content (ad, show or educbit) commenced as the result of a channel change, the code for that segment was preceded by a negative sign. Finally, periods where the channel was rapidly changed to several different stations were coded as "channel scans".

It should be noted that because recording of the TV was not continuous, it was not always possible to observe the exact moment when broadcast content changed (e.g. program segment to commercial block). Thus, content boundaries could, in principle, occur up to 18 seconds before they were observed. To minimize this type of inaccuracy, raters were instructed to estimate at what

point between two inserts a change to different content had occurred.

Although detecting a change in broadcast content was relatively easy, identifying programs by name was less so. Thus, whenever necessary, raters consulted TV Guide broadcast schedules and program descriptions whenever necessary as a means of determining program names. If a rater still was unable to provide a program's identity, she would enter "EUP" (for experimenter uncertain of program) as the program's name. This code was used whether the identification problem was due to rater unfamiliarity or temporary fluctuations in the quality of the inserted TV image (caused, for example, by sunlight being reflected off the TV and into the camera lens). To summarize, second pass rating produced a file (for each tape) containing the timecode for those videoframes during which the rater observed a change in what was being broadcast. Associated with each line of timecode in the file was a code designating what kind of boundary this was (commercial to program, for example), whether a channel change was involved, and the name of whatever was now being broadcast (e.g. "commercial" or "Sesame Street").

Third Pass Rating

The third pass through the tapes involved rating an individual family member's visual attention to the

television. The rating program designed for this purpose would zoom the tape to the videoframe where the viewer of interest entered the room. It would then pause the deck, inform the rater (via the computer console) that the start of a viewing session had been found, and then turn control of the videodeck over to the user. Other studies have reported that the median look length for children is only about 3 seconds (see Anderson & Burns, 1991; Anderson & Field, 1991). Thus, to ensure that looking behavior was accurately rated, raters played the tapes slowly (typically at 1/20th normal speed) during this rating pass. When a viewing session was completely rated, the user would signal the computer by pressing a special key on the keyboard. This caused the computer to zoom the tape to the videoframe where the target viewer next entered the room.

The rating buttons functioned somewhat differently during the third pass through the tapes. During this pass, the microcomputer continuously monitored not only when rating buttons were depressed but when they were released as well. To rate the beginning of a look at the TV, for example, the rater pressed the "look-in-progress" button on the deck-control/rating panel. He continued to hold that button down until he encountered the first videoframe where the subject was no longer looking (at which point he would release the "look" button). These actions caused the

computer to store the timecode being read both when the "look" button was depressed and when it was released. The former was coded as the onset of a look, the latter as an offset.

A "look-in-progress" was defined as visual orientation to the television screen. Whenever possible this judgement was based on the direction of gaze of the eyes. If the eyes could not be seen (e.g. the subject was seated with her back to the camera) the judgement was based on the orientation of the subject's head. Two other rating buttons were used during the third pass through the tapes. One was employed to indicate general uncertainty as to the viewer' attention, the other was used to indicate uncertainty caused by one of the six second inserts.

General uncertainty was defined as a period when the subject was in an area of the room from which she could see the TV but the rater was incapable of determining whether she was looking. A viewer might, for example, remain in the viewing room but move to an area not covered by the wide angle lens. Alternatively, another family member might step directly in front of the wide angle camera, thereby obscuring the view of anyone else in the room. Finally, general uncertainty might arise from a temporary degradation in the video image (e.g. the room lights suddenly go off making it impossible to see the subject

until the automatic iris on the camera adjusted to the new lighting conditions). The rater recorded the exact onset and duration of such periods by depressing and releasing the "general uncertainty" rating button on the deck-control/rating panel. By definition, periods of general uncertainty could not co-occur with a look-in-progress.

The second type of uncertainty was reserved for those brief intervals where the rater's ability to code viewer attention was interrupted by a six second program insert. The reader will recall that program inserts periodically appeared (once every 18 seconds) in the lower right hand corner of the videotape image. Children frequently sit on the floor while viewing television (Nathan, Anderson, Field & Collins, 1985). Thus, it was sometimes the case that a subject's image appeared in the same portion of the video where inserts appeared. When this occurred, the insert would "cover" the subject, preventing the rater from being able to rate viewer attention to the TV. As soon as the insert was over, or the subject moved to another area of the room, attention was ratable again. A special rating procedure was used to code these portions of the videotape.

Unlike general uncertainty, uncertainty due to an insert could be coded as being in progress simultaneous with a look at the TV. For example, if a look was in progress (hence the "look" button was depressed) when an

insert suddenly covered the subject's image, the rater would continue to depress the look button. He would also, however, depress the "insert" button. When the first videoframe after the insert ended was reached, the rater paused the deck. He would then release the insert button and make a decision as to whether the subject was still looking. If the look was still in progress, the rater would continue to hold the look button down and re-commence playing the tape. If, on the other hand, the subject was no longer looking at the TV, the rater released the look button before putting the tape in motion again. This procedure ensured that both the insert, and the look that ended while it was in progress, would be coded as though they ended during the same videoframe.

An analogous procedure was employed whenever an insert interrupted the rater's ability to code a subject who was looking away from the TV. In other words, when the insert interruption concluded, the deck was paused, the insert button was released, and a decision about attention to the TV was made. If a look was now in progress, that button was depressed. Thus, looks that had not been in progress before the insert but were in progress after it had the same timecode for their onset as the insert had for its offset.

It should be emphasized that these insert rating procedures were not employed for every insert that occurred. Rather, they were used only when the insert and the viewer's head happened to be located in the same portion of the video image. When the experimenter reduced the third pass data files in preparation for analysis, she interpreted insert interruptions in the following way. If the subject was looking away from the TV both before and after an insert, the subject was assumed to have been looking away during the insert interval as well. Likewise, if a look was in progress both before and after an insert, it was assumed to have endured throughout the intervening six second insert interval. If there was a shift in the subject's attention between insert onset and offset (e.g. looking at onset, not looking at offset), it was assumed that the shift occurred midway through the insert interruption. Occasionally the end of an insert interruption would coincide with the end of a subject's viewing session. This was most typically caused by the television being shut off. In such instances, the insert interval was assumed to be comprised by whatever attentional state was in progress at insert onset. Rarely, the onset of an insert interruption coincided with the first frame of a subject's viewing session. It was the experimenter's sense that the overwhelming majority of

these instances arose from the fact that the subject had turned the television set on and was in the process of selecting a channel to view. Thus, these intervals were coded as though a look had been in progress when the insert interruption began.

The experimenter designed the insert coding procedure so that levels of uncertainty were not unnecessarily inflated. Moreover, it seemed likely that children might sit on the floor (and generally closer to the TV than furniture made possible) more often during one type of program than another (e.g. child versus adult shows). Had this been the case, rating the interruptions as periods of general uncertainty would have systematically increased the loss of attention data during exactly those intervals of broadcast content that children might deem the most attention-worthy. Finally, since the tendency to view from furniture is known to increase with age (Nathan et al., 1985), any other procedure might have created artificial age differences in levels of uncertainty.

Raters completed a second task while coding the tapes for viewer attention. Namely, they kept detailed notes of any rating difficulties they had, and any first or second pass data inconsistencies they noticed. For example, the rater might note that one of the subject's viewing sessions began several frames before or after the entrance time

indicated in the first pass file. Alternatively, she might recognize and be able to name a television program that had been coded as EUP. Overwhelmingly, however, raters' notes pertained to tape segments that were difficult to rate. Each note included a description of the nature of the problem encountered, the timecode where it occurred, how the rater coded it, and the reasoning behind the decision made. These notes were used during the review process (see Rating Accuracy section).

To re-cap, third pass rating generated a file that contained a continuous record of the subject's visual attention to the television. That record took the form of a separate line of data for each shift in viewer attention toward or away from the TV. Onsets and offsets of general and insert-induced uncertainty were also recorded. Each line contained a numerical code for the type of shift observed as well as the timecode of its occurrence. Third pass rating also produced a list of tape locations where difficulties were encountered.

Rating Accuracy

First and second pass rating accuracy were ensured by having an experienced rater review each of the data files. The first pass review process involved using a computer program specifically designed for this task. Using the rating apparatus already described, this program read the

timecode on the tape (as it played) and compared it with that stored in the data file. Each time the tape reached a videoframe that the data indicated was a viewer entrance or exit time, the computer console would beep. In addition, the reviewer was informed (via the computer console display) as to which family member the rater believed was making this particular entrance/exit. When the reviewer noticed an error, in either viewer identification or the exact timing of the entrance/exit, a note was made on a paper printout of the data file. Corrections to the files were later made via the use of a commercial editing program. Any remaining errors in the files were detected and noted by the third pass raters. The third pass reviewer verified the resolution of these errors (by looking at the videotape) and made any necessary changes in the data via the same commercial editing program.

As already noted, detecting a change in what was being broadcast on the TV was a straightforward and relatively simple task. Thus, second pass data review primarily involved attempting to identify programs that originally had been rated as "EUP" - experimenter uncertain of program. Whenever the reviewer (a highly experienced rater) was able to identify the program in question, its name (and the timecode of its occurrence) was noted on the paper printout of the file. Again, any additional changes

in the record suggested by the third pass rater were verified by the third pass reviewer before they were implemented. All editing of the files was achieved using a commercial word-processing package.

The final second pass data files indicated that coders were extremely successful in identifying what was being broadcast in subjects' homes. EUP and channelscan hours totaled no more than 43.56 minutes for any one subject. This represents a maximum 3.8 percent of time with TV (with an average and standard deviation of .9 and 1.1 percent, respectively). An age by sex analysis of variance on percent of time in the room coded as EUP/Channelscan was conducted. It revealed no significant main or interaction effects. Thus, second pass procedures produced nearly complete records of the content to which subjects were exposed, for all combinations of age and sex.

Several steps were taken to ensure accuracy in third pass rating. First, a training exercise was designed by creating a file that contained only the timecode for a subset of one subject's viewing sessions. Running the third pass rating program with this file as input enabled the trainee to quickly move to and between the selected viewing sessions. As a whole the training sessions provided the trainee with substantial exposure to the wide variety of rating conditions that he was likely to

encounter with other subjects. For example, there were sessions where the rater had to use the insert button, sessions where lighting problems slowed rating and sometimes necessitated use of general uncertainty, sessions where the subject was shifting attention between reading material and the television at a rate of every other frame, and so on. Each viewing session in the training exercise was accompanied by a description of the problems to be encountered and instructions on how the rater should respond to these difficulties. The experimenter was present during the majority of this training in order to answer any questions. When the rater had completed the training sessions and both he and the experimenter felt that the rating procedure has been mastered, the rater would proceed to code other subjects' viewing behavior.

When all of a subject's viewing sessions had been rated, the data files (one for each videotape) were submitted to the third pass review process. This process was completed by the experimenter and one other highly experienced rater. They began the process by running the data files through an error checking program. It detected any illogical rating sequences. These errors primarily involved looks or periods of uncertainty that began and ended during the same videoframe, or instances where the rater inadvertently "released" the look (button) before

"releasing" the insert (button). Errors of the former type usually were caused by momentary rater indecision. In other words, the rater released a button before fully depressing it. Sometimes the circuit had already been completed and the press and release were recorded. In any event, the reviewer investigated each illogical sequence by looking at the tape. In addition, the reviewer investigated all areas of the tape that were rated as general uncertainty and all areas that the rater had noted as difficult to code. The reviewer also periodically sampled look intervals to ensure that the rater was consistently accurate in coding look onsets and offsets.

The vast majority of coding changes made by the two reviewers involved resolving areas of general uncertainty. Unfortunately, the original raters sometimes used this button to signal that they couldn't readily decide whether the subject was looking, rather than reserving it for areas where it was truly impossible to see whether the viewer was looking at the TV. Raters were uniformly highly accurate in coding onsets and offsets of looks. Any areas of a tape that were especially difficult to resolve were viewed by both reviewers and a joint decision was made.

Four hours and thirty-nine minutes of one subject's time in the room was reviewed separately by each reviewer. For the forty-five viewing sessions comprising this

exposure, agreement in percent of time looking averaged 98.5 percent. Moreover, total time coded as looking during these sessions was highly correlated (Pearson $r(45) = .98$), as was total time coded as general uncertainty (Pearson $r(45) = .99$). In fact, disagreements occurred for a total of only 3.43 minutes of this subject's exposure on this tape.

Categorizing Broadcast Content

All television segments broadcast in the thirty families' homes were categorized on the basis of age of intended audience. Child-oriented content was defined as content produced for an audience aged 12 years and younger. Adult content was defined as having been produced for an audience aged 13 years and older. These definitions were taken from the 1983 CRITC Program Categorization System Manual (CRITC, 1983). The actual procedure for coding the age of a segment's intended audience was different for programs versus commercials and educbits.

Categorizing Programs

A master list was created which contained one entry for each unique program/movie name that appeared in any of the thirty-two families' second pass data files. The CRITC database was then consulted. If the program in question was part of that database, its audience code was recorded. Programs movies not appearing in the CRITC database were

coded according to the definitions given above. Decisions were based on any combination of viewer familiarity with the program, TV Guide program descriptions, Leonard Maltin's TV Movies movie descriptions (1982), and experimenter observation of the show as it appeared on a family's videotape.

Coders were highly successful in categorizing the age of a program's intended audience. Of the 1511 distinctly named programs/movies, only 47 (or less than 3.2%) were unclassifiable. Two unclassifiable "shows" were "blankscreen" and "technical difficulties". "Technical difficulties" referred to instances where the video broadcast suddenly degraded or was replaced by a message from the originating television station stating that they were experiencing such difficulties. Only one of the thirty-two subjects included in this study was in the room during such an interval. Her total exposure to technical difficulties amounted to only 1.91 minutes. Thus, this interval was treated as though it were exposure to a program for an audience of uncertain age. "Blank screen" described any period where the TV was tuned to a station that had ceased broadcasting for the day. None of the thirty-two subjects was in the room during an episode of blank screen.

Given that only 3.2 percent of all programs (including movies) broadcast in subjects' homes were unclassifiable for age, it is unsurprising that these programs comprised only a minute proportion of the totality of programming to which subjects were exposed. In fact, we were able to classify (on the audience dimension) all time exposed to programming for twenty of the thirty-two subjects. For the remaining twelve subjects, total time with unclassified programming ranged from 1.301 minutes to 3.626 hours. Although three hours was unusual, this subject was in the room with TV for a total 48.68 hours, 40.5 of which were comprised of program content. Thus, even in the worst case, more than 91 percent of time with programming was classified for audience age. For the sample as a whole, less than 1 percent of total time with programs was coded as uncertain for audience age (5.349 of 589.056 hours).

Categorizing Ad Blocks and Educbits

Advertising blocks were categorized on the basis of the intended audience for surrounding programming. The same was true for educbits. Thus, ad blocks that were both preceded and followed by child audience program segments were categorized as intended for children. The same was true for blocks embedded within adult audience show segments. Ad blocks (or educbits) that were preceded by child content and followed by adult content formed a third

age category. A fourth age category (for both ad blocks and educbits) was formed by blocks (or educbits) that were preceded by an adult program segment and followed by a child program segment.

If an advertising block or educbit occurred between program segments that were unclassifiable with respect to age, the intended audience for the ad/educbit was said to be uncertain. Also included in this uncertain category were advertisements and educbits for which there was no information about surrounding programming. This was the case, for example, when an ad was preceded by the TV being off and was followed by a channel change. Alternatively, the ad may have begun with a change to the channel it was on, and ended with the TV being turned off, etc.

Total exposure to uncertain age advertising ranged from 0 to 11.76 minutes, with an average across subjects of 2.52 minutes (standard deviation = 10.98 minutes). In no case was more than 8.2 percent of a child's time with advertising content unclassifiable with respect to age. The average across subjects was 1.3 percent with a standard deviation of 1.8 percent. As educbits were rarer events, only 1.9 percent (in the worst subject's case) were unclassifiable, with an average of .1 percent for the group (standard deviation = .4 percent).

Summary

In total, the thirty-two subjects comprising this study were in the room with TV for 593.909 hours. Only 4.864 of those hours were coded as EUP or channel scans. Of the remaining 589.045 hours, 95.498 were coded as being ad blocks, 487.866 were coded as being program segments, and 5.681 hours were coded as educbits. Difficulties in coding audience age were encountered for 1.355 hours of advertising, 5.349 hours of programming and less than one minute of educbits. These totals comprise 1.42 percent of total time with advertising, 1.09 percent of total time with programming and less than .1 percent of total time with educbits. Thus, we were able to classify 98.1 percent of all time with TV (across subjects) as being a program, an advertising block or an educbit intended for adults or children (or in the case of ad blocks and educbits, as having programming for different aged audiences before and after it). For individual subjects, the percent of time with TV that was completely coded (for segment type and intended audience) varied from 91.3 to 100 percent, but averaged a high 98.4 percent (standard deviation equal to 2.2 percent). An age by sex analysis of variance on percent of time in the room that was uncertain (due to eup, channelscans or uncertain age content) was conducted. No significant age, sex or interaction effect was obtained

(before or after adjusting for heterogeneity of variance). In sum, data loss due to equipment and coding problems was uniformly minimal across age and sex groups.

Percent Attention Calculations

Once all broadcast segments that a subject was exposed to had been classified for type (program, advertising, educbit) and audience (child or adult), third pass files were consulted to determine levels of attention. Specifically, a computer program was written to sum the total seconds exposed, total seconds looking, total seconds looking away and total seconds attention to the TV was uncertain (general uncertainty) for each segment. The resulting data file was submitted to yet another program which summed total seconds exposed, looking, looking away, and attention uncertain (across viewing sessions) for each of the ten distinct segment classes. To reiterate, those 10 distinct segment classes were child advertising, child programming, child educbits, adult advertising, adult programming, adult educbits, child before/adult after ad blocks, child before/adult after educbits, adult before/child after ad blocks, adult before/child after educbits. Percent attention was calculated as total seconds looking over the combined total of seconds looking at and away from the TV.

The attention uncertain totals revealed that subjects were in un-monitored areas of the room for non-trivial amounts of time. Specifically, attention uncertainty (during content coded segments) ranged from a minimum of 23.49 minutes to a maximum of 13.71 hours. This translates to a minimum of 2.4 to a maximum of 57.8 percent of (content coded) time in the room. The subject with the highest percent of time rated as attention uncertain was a 2-year-old male. He frequently played with toys in an area of the room that was just beyond the camera's purview, but from which he could have been looking at the TV. He was in this area of the room more when child content (69.1%) was broadcast than when adult content was on the TV (52.2%). This subject's percent attention to the TV in general (i.e. across all types of content) as well as percent attention to the different content classes was no different, however, from the other 2-year-olds. In no case was he an outlier, or even the child with the minimum or maximum value. It was deemed appropriate, then, to retain this subject, despite the fact that his attention data were based on a reduced sample of 9.99 hours (out of a total 23.68 hours with coded broadcast content).

The level of uncertainty for attention to the TV averaged 3.39 hours per subject, or 19.8 percent of time in the room with content that had been classified according to

our dimensions. Clearly, this is a considerable proportion of children's potential looking time. Accordingly, an age by sex analysis of variance was performed separately for 1) total time attention uncertain during coded content and 2) percent total time with coded content that attention was uncertain. In neither case were there any significant effects. Thus, it seemed unlikely that attention uncertainty would contaminate any age or sex effects in the percent attention analyses.

Percent of time rated attention uncertain was also calculated separately for each of the four central content classes (child programming and advertising, adult programming and advertising). An age by sex by intended audience by segment type analysis of variance produced a significant age by segment type interaction ($F(3,24) = 3.358$, $MSE = .002$, $p = .035$). Percent attention uncertain for advertising minus percent attention uncertain for programming difference scores (the quantity tested in the interaction source of variance), however, had markedly different variances across age groups. The variance ratios were as high as 13 to 1 (for 2-year-olds versus 5-year-olds).

This condition leads to inflated Type I error rates. The Brown-Forsythe F* statistic is recommended in such cases, particularly with group sizes as small as those in

the present study (Myers & Well, 1991). Thus, this test was used to re-calculate the age main effect in difference scores (i.e. the age by segment type interaction). It indicated that the age by segment type interaction in percent uncertainty was now marginally significant ($F^*(3,21) = 2.514$, $MSE = .005$, $p > .09$). In sum, it is clear that observing visual attention to the TV via time-lapse recordings leads to non-trivial proportions of time that viewer attention is impossible to monitor. However, careful analysis of the distribution of such periods across content class (and age) revealed that this limitation was unlikely to systematically bias attention levels.

Exit Rate Calculations

Exiting rates per hour of exposure to each class of broadcast content were calculated by combining first and second pass records. First, every broadcast segment that a subject was exposed to was classified according to type, as well as the age of its intended audience. Next, total cumulative hours of exposure to each content class was calculated. A computer program then classified each exit according to what class of content was being broadcast during the videoframe when it occurred. Exit rates were then computed as the total number of exits that occurred during a content class, divided by the number of hours exposure to that class of broadcast content.

The experimenter was able to classify the vast majority of exits. This follows directly from the above reported success in classifying broadcast content. The total number of unclassifiable exits (i.e. exits that occurred either during periods of EUP or during programs, ad blocks or educbits that couldn't be coded for audience age) ranged from a minimum of zero to a maximum of 25 (with a mean of 3.97 and a standard deviation of 6.141). This represents an average 2.1 percent of exits per subject.

Neither the total number of exits that were uncodable, nor the percent of all exits that they comprised, varied significantly as a function of age. Moreover, when the percent of all program exits that occurred during uncertain age programming was compared with the same quantity for advertising (via an age by sex by segment type repeated measures analysis of variance) no significant differences overall, nor as a function of age and/or sex were found. Thus, the exiting analyses were based on a nearly complete record of exiting behavior that showed no systematic pattern of data loss across subject or stimulus variables.

CHAPTER 3

RESULTS

The primary objective of the current study was to determine whether the developmental progression in understanding television advertising is accompanied by different levels of interest in, or avoidance of, commercials. It was predicted that as children's understanding became more sophisticated, they would increasingly opt to look away from the TV during advertising blocks. Moreover, it was predicted that children's decisions about when to leave the viewing room would reflect an increasing tendency to selectively avoid commercial content as well. These effects were expected to be modified by whether the content currently being aired was intended for adults or children. Specifically, it was predicted that selective avoidance of commercials would occur at earlier ages within child than adult content. In other words, younger children may show lower levels of attention, and higher frequencies of exiting, during commercial content relative to program content only when the ads are embedded between segments of shows intended for children. Other more detailed predictions involving patterns within and across age groups are presented

individually (below) along with the statistical test(s) of their veracity.

A note about analysis procedures is in order. Several of the dependent variables examined in this study had largest to smallest group variances that exceeded a four to one ratio. This condition leads to positively biased F tests. One remedy for such situations is to transform the variables such that variances are stabilized and the data become more nearly normal. This was deemed inappropriate here for two reasons. There were no compelling theoretical grounds upon which to base the choice between competing transformations and group sizes were small enough (four subjects per age/sex cell) that assessing parent distribution shape (with any certainty) was impossible. Thus, the Brown-Forsythe F* was employed (whenever the 4:1 criterion was exceeded). Individual contrasts between means from groups with heterogeneous variances were tested using separate variance t-tests with adjusted degrees of freedom. T-values for these tests are denoted as t'.

Family-wise error rates were controlled in the following manner. T-tests involving post-hoc pairwise comparisons were evaluated against Tukey critical values (with family-wise error set at the five percent level). Subsets of pairwise, or any other contrasts that had been dictated before analysis, were tested using Bonferroni's

procedure. Together these techniques should serve to limit Type I error without unduly sacrificing power to detect effects (Myers & Well, 1991).

Amount of Exposure

Table 1 presents average weekly exposure hours by age group, intended audience, and segment type. The means tabled in the "Total" section include exposure to segments that were coded as uncertain for age of intended audience.

Subjects were observed with TV an average 13.371 hours per week (standard deviation = 6.887). Exposure for the lightest viewer (a 2-year-old male) averaged 3.623 hours per week as opposed to 34.078 hours for the heaviest viewer (a 5-year-old male). The pattern of means in Table 1 suggests a rise in exposure to age five with a steady decline thereafter. An age by sex analysis of variance produced a significant main effect for age ($F^*(3,24) = 3.44$, MSE = 115.09, $p < .04$). The two most extreme groups were the two-year-olds, who were in the room an average 9.729 hours per week and the five-year-olds, who averaged 19.063 hours ($t' = -2.380$, df = 12.7, single-test $p = .034$). None of the pairwise comparisons were significant, however, when Tukey's criterion was used. Nevertheless, there is reason to believe that the obtained pattern of means was due to more than just chance. First, the quadratic contrast between age groups was significant

(F(1,24) = 5.855, MSE = 42.854, p = .023), indicating a curvilinear pattern among means. Second, Huston et al.'s (1990) diary study of three- to seven-year-olds reported the same increase to age five and decline thereafter.

Unsurprisingly, total weekly exposure to programming followed the same pattern. Specifically, there was a significant main effect for age (F*(3,25) = 3.408, MSE = 77.471, p < .036) and the two-year-olds experienced significantly less exposure than the five-year-olds when a five percent single-test alpha was used (7.958 hours versus 15.611, t' = 2.388, df = 12.25, p < .034, Tukey critical t = 2.97). Again, none of the pairwise comparisons were significant according to Tukey's criterion, though the quadratic contrast was significant (F(1,24) = 5.835, MSE = 28.811, p = .024).

Though weekly exposure to advertising appeared to follow the same pattern, this was verified by submitting it to a separate analysis. The quadratic contrast between age groups, for example, was significant (F(1,24) = 4.816, MSE = 1.440, p = .038). Moreover, the two-year-olds had the lowest mean (1.591 hours) and the five-year-olds the largest (3.11 hours). By Tukey's criterion, this difference only approached significance (t' = -2.093, df = 13.3, p < .028, Tukey critical t = 2.94). The test for a

main effect of age was not significant ($F^*(3,24) = 2,874$, $MSE = 3.837$, $p < .079$).

One might suspect that amount of exposure to television would vary as a function of both viewer age and the age for which a particular segment was intended. Earlier work, for example, has established that while children's comprehension of programming intended for them is generally good by age eight, comprehension of adult programs doesn't reach adult levels until about eighth grade. Thus, one might expect the eleven- and twelve-year-old children to spend significantly less time with child content and significantly more time with content produced for adults. The data only partially support such an hypothesis. While average weekly exposure to child content did vary as a function of age, exposure to adult content did not.

More specifically, there were no age differences in average weekly exposure to adult programming or adult advertising. As a whole, the sample averaged 6.031 hours per week with adult programming (standard deviation = 3.928), 1.276 hours per week with ads surrounded by adult program segments (standard deviation = .911), and 7.340 hours per week with adult content in general (standard deviation = 4.819).

Both classes of exposure to child content, on the other hand, varied as a function of age. There was an age main effect for programming ($F^*(3,21) = 6.143$, MSE = 22.899, $p < .005$) as well as advertising ($F^*(3,19) = 5.488$, MSE = .616, $p < .008$). Moreover, both quantities showed the same increase to age five and decline thereafter that was found for total exposure to television, in general. Tests for a quadratic component in the pattern of means as a function of age was significant for child programming ($F(1,24) = 14.60$, MSE = 7.861, $p < .001$) and child advertising ($F(1,24) = 16.328$, MSE = .191, $p < .001$) as well.

As can be seen in Table 1, however, the eleven/twelve-year-olds were the most discrepant group. Pairwise comparisons indicated that they spent significantly fewer hours per week with child programming than both the five-year-olds (2.322 versus 7.839 hours, $t' = 3.95$, $df = 12.77$, $p < .002$, Tukey critical $t = 2.94$) and the seven/eight-year-olds (2.322 versus 5.614 hours, $t' = 3.35$, $df = 10.84$, $p < .009$, Tukey critical $t = 3.01$). In addition, they spent significantly fewer hours per week with child advertising than the did the seven/eight-year-old group (.448 versus .974 hours, $t' = 3.33$, $df = 13.31$, $p < .005$, Tukey critical $t = 2.94$). Though five-year-olds were in the room with child advertising for 1.221 hours per week on

average, versus the approximate 27 minutes for eleven-year-olds the difference was only marginally significant ($t' = 2.970$, $df = 9.3$, $p < .015$, Tukey critical $t = 3.13$). The two year-olds' exposure levels (3.555 and .497 hours per week for child programming and advertising, respectively) fell between the middle two and the oldest age groups, and none of the pairwise comparisons involving them were statistically significant (using Tukey's criterion).

In sum, the greatest age-related difference in exposure (identified by these analysis) was the sharp drop in the eleven and twelve-year-olds time with child programming. As there were no age differences in amount of exposure to adult content (for either ads or programs), it would appear that only these children had a preference for content aimed at their age group (recall that adult content is defined as intended for an audience aged 12 years and older). This possibility was directly tested by calculating two difference scores (adult minus child) for each subject: one for weekly exposure to programming, the other for weekly exposure to commercials. The average of these scores was significantly different from zero (and positive) for both programming ($t = 4.073$, $df = 7$, $p < .006$) and advertising ($t = 2.877$, $df = 7$, $p < .024$), but only for the oldest age group.

That the younger groups spent roughly equivalent amounts of time with adult and child content might be interpreted as indicating a lack of preference for child content on their part. The bulk of programming available on television, however, is not aimed at a child audience. Given that age differences in total exposure to TV were small, one could instead marvel that younger children were able to find sufficient amounts of child content to comprise an average fifty percent of their time with TV.

In any case, it is clear that even children as young as two-years-old are in the room with advertising for substantial amounts of time (an estimated average 82.7 hours per year). It is also clear that despite known age-related changes in children's understanding of and attitudes toward ads, this level of exposure does not vary substantially between two and twelve years of age.

One might argue that this pattern of results would obviate the need for an analysis of exiting behavior. If children of all ages are exposed to roughly equivalent amounts of advertising, older children can't have been successful in selectively avoiding commercials - regardless of the timing of their exits from the viewing room. This argument is not necessarily correct. The proportion of each broadcast hour that is devoted to advertising varies as a function of time of day, day of the week, intended

audience of the program being aired, and so on. To accurately assess whether amount of exposure to advertising had been successfully reduced, then, one would have to calculate for each exit during an ad, how much exposure would have accrued had the exit not occurred. Thus, it is possible that the older children remained in the room for a lower proportion of all the advertising broadcast during programs they selected to view than the younger children did. Clearly, if the exiting analyses indicate systematic leave-taking during advertising blocks, this possibility should be explored.

Percent Visual Attention

Before presenting the results for the percent attention analyses, an explanation concerning which segments were included is in order.

Calculating Percent Attention

At least three different approaches to calculating percent attention to child and adult advertising could have been used. One approach would include as advertising only those ad blocks which had received child and adult audience codes (i.e. ad blocks situated between program segments intended for the same age audience). A second approach would be to treat educbits as though they were advertising segments. Although this may not seem an obvious choice, educbits invariably occurred between ads. Thus, it would

not be surprising if children responded to them as though they were part of the advertising block.

As the reader can see in Table 2, levels of attention to child and adult educbits were more similar to those for child and adult advertising than programming. This was tested by comparing the difference between percent attention to educbits and ads with that between educbits and programming. The average difference between these difference scores was large and negative for child content ($t = -6.047$, $df = 25$, $p < .001$). This indicates that within child content, percent attention to educbits was indeed more similar to ads than programming. Moreover, this finding held for all but the two-year-old group. For them, all three content types received the same level of attention (in the statistical sense). The average difference between difference scores was not as large for adult content. In fact, it was significant only for the eleven/twelve-year-old group. For the group as a whole, as well as for the five and the seven/eight-year-old groups, however, the difference was in the expected direction. Again, the two-year-olds showed equivalent levels of exposure to all three segment types. Together these results suggest that children's attentional responses to educbits is more similar to their responses to ads than programming.

The third analysis approach would (in addition to adult and child educbits) include those segments that occurred between programming intended for different aged audiences. Table 3 presents percent attention to these segments by age, as well as the number of subjects in each group who spent any time in their presence. It is clear from the number of subjects in each cell that these segments were rare, particularly adult before/child after educbits. Children's levels of attention to mixed-age segments was most like that which was exhibited during ads with the same code as the "after" programs. In other words, child before/adult after attention levels were more similar to those for adult ads and educbits than child-oriented ones. Thus, the third approach would treat adult before/child after segments as though they were child-oriented advertising, and would include child before/adult after segments as adult-oriented ones. It should be noted that child before/adult after ad blocks and educbits only comprised an average 3.44 percent of total exposure to adult advertising (where adult advertising is defined as all adult and adult after non-programming segments). Adult before/child after segments comprised a scant 2.21 percent of all child advertising and educbit exposure combined.

Three different ANOVAs were computed, one for each of the approaches outlined above. The pattern of results was

the same for all three. As the third approach had the advantage of including all attention-codable time in the room (that did not receive an uncertain audience code), the experimenter has chosen to report those results here. Table 4 presents average percent attention to child and adult advertising and programming, by age, using the definitions employed in the third approach.

Predictions and Results

As noted above, the percent attention analyses had two main goals. The first was to establish whether children's attention to advertising blocks was depressed relative to programming. The second was to determine whether viewer age or intended audience age modified such an effect. Thus, a four (age) by two (sex) by two (intended audience) by two (segment type) repeated measures analysis of variance on percent attention was calculated. Before proceeding with the tests of central interest, it should be noted that no sex effects were predicted or obtained.

Attention across all content types averaged (from youngest to oldest) 35.91, 61.81, 72.71, and 71.42 percent. As predicted, then, the test for an age main effect was significant ($F(3,24) = 8.645$, $MSE = 844.95$, $p < .001$). The same was true when the Brown-Forsythe test was used instead ($F^*(3,30) = 10.91$, $MSE = 641.26$, $p < .001$). As has been found previously, increases in percent attention were

relatively small after age five. None of the three older groups were significantly different from one another in overall levels of attention. Percent attention for the two-year-olds, on the other hand, was significantly lower than that for the five- ($t' = 2.890$, $df = 11.7$, $p < .008$), the seven/eight- ($t' = 4.208$, $df = 11.03$, $p < .001$) and the eleven/twelve-year-old groups ($t' = 4.367$, $df = 9$, $p < .001$). It should be noted that these were planned, one-tailed tests, all of which exceeded the significance level required to maintain a five percent family-wise error rate by Bonferroni's procedure.

There was a significant main effect of intended audience ($F(1,24) = 32.090$, $MSE = 184.43$, $p < .001$), such that percent attention to child content was higher than that for adult-oriented segments. Percent attention averages (for the entire sample) were 69.31 for child segments and 53.49 for segments produced for adults.

For much the same reasons as were described in the analysis of exposure hours, a viewer age by intended audience interaction was predicted. More specifically, it was expected that percent attention to child content would increase from age two to age five. It would then remain relatively stable through age eight, and drop again for the oldest group. Percent attention to adult content was also predicted to increase from age two to age five. Only the

five-year-olds, however, were expected to exhibit significantly higher levels of attention to child (as opposed to adult) content. The seven/eight-year-olds were predicted to attend child content at levels similar to that exhibited by five-year-olds. Their level of attention to adult programming, on the other hand, was expected to be somewhat higher, thereby reducing the child versus adult content difference in this group. The oldest children were anticipated to devote lower levels of attention to child content than the two middle groups. Moreover, the eleven/twelve-year-olds were expected to have significantly higher levels of attention to adult content than the two- and five-year-olds, and perhaps the seven/eight-year-olds as well.

Average percent attention to child and adult content is presented by age in Table 5. Although the pattern of means appears to conform to at least some of the comprehension theory predictions (with the glaring exception of the oldest group), the viewer age by intended audience factor was not significant ($F(3,24) = .666$, $MSE = 184.43$, $p > .581$). This finding might be interpreted as being supportive of the reflexive hypothesis. Examination of the age trends within adult and child content, however, suggest that this is not the case.

Specifically, two-year-olds had significantly lower attention to child content than both seven/eight-year-olds ($t' = 3.62$, $df = 7.92$, $p < .004$) and eleven/twelve-year-olds ($t' = 3.34$, $df = 8.12$, $p < .005$). The same was true for adult content ($t' = 4.05$, $df = 13.65$, $p < .001$, and $t' = 4.98$, $df = 10.84$, $p < .001$). The predicted differences between the two- and five-year-olds percent attention to child ($t' = -2.724$, $df = 10.4$, $p < .011$) and adult content ($t' = -2.299$, $df = 13.9$, $p < .019$) did not reach significance by Bonferroni's criterion. The greatest discrepancy between the results and predictions based on comprehension theory was the lack of a drop in the eleven/twelve-year-olds' percent attention to child content. Apparently, television content intended for younger audiences remains compelling enough to warrant high levels of attention even in the oldest age group.

Table 6 presents average percent attention to advertising and program content by age. As the pattern of those means suggests, a main effect of segment type was obtained ($F(1.24) = 23.511$, $MSE = 44.088$, $p < .001$). Contrary to what the reflexive hypothesis would predict, percent attention to advertising was significantly lower than attention to program content. The averages for the entire sample were 61.41 and 55.34 percent for programming and advertising, respectively.

The outcome for the test of an age by segment type effect was of central importance to the objectives of this study. It was predicted that the segment type effect would not only vary as a function of age, but that there would be a linear relationship between the magnitude of the difference scores and age. In other words, attention to commercials would become increasingly more depressed (relative to programming) with age.

The age by segment type interaction was, in fact, significant ($F(3,24) = 7.453$, $MSE = 44.088$, $p < .001$). This was true when a Brown-Forsythe test of the age effect on average difference scores was calculated as well ($F(3,23) = 3.99$, $MSE = 230.88$, $p < .025$). More importantly, the test for linearity in the magnitude of the difference scores as a function of age was significant ($F(1,24) = 10.97$, $MSE = 76.88$, $p < .003$). The average difference scores, in order by age, were -2.508, 5.980, 9.051, and 11.775.

The reader will recall that the size of the segment type effect within the two- and five-year-old groups was of special interest. Contrary to what one would predict on the basis of the comprehensibility hypothesis, anecdotal reports and one finding obtained in the laboratory have suggested that two-year-olds' attention to commercials may be elevated relative to what they exhibit in the presence

of program content. Two-year-olds in this study, however, showed no differentiation in their attention to television as a function of whether advertising or program content was being aired. For five-year-olds the difference between percent attention to commercials and program segments approached significance by the one percent criterion dictated by the Bonferroni procedure ($t = 2.141$, $df = 7$, $p < .035$). The difference for both the seven/eight- ($t = 11.037$, $df = 7$, $p < .001$) and the eleven/twelve-year-old groups ($t = 3.583$, $df = 7$, $p < .005$) was large and significant.

The segment type effect was also modified by an interaction with intended audience ($F(1,24) = 11.454$, $MSE = 32.164$, $p < .002$). As was predicted, the discrepancy in percent attention to ad blocks and show segments was greater during child content. The average differences (percent attention to programming - percent attention to commercial blocks) were 9.08 and 3.0 for child and adult content, respectively. Only the child content difference was significantly different from zero ($t = 7.287$, $df = 31$, $p < .001$). Clearly, the context within which ads appeared had a significant impact on the likelihood that they would be attended.

The reader will recall that the possibility of a three way interaction between viewer age, segment type and

intended audience was raised. More specifically, it was suggested that while differences in percent attention to commercial and program content should increase in magnitude with age for both child and adult content, depressed levels of attention to ads should occur at younger ages within the child content domain. Table 7 presents the average difference between percent attention to ad blocks and shows separately for child and adult content by age.

The age by segment type by intended audience interaction was not significant ($F(3,24) = 1.371$, $MSE = 32.164$, $p > .274$). The patterns within child and adult content, however, did conform to expectations. Five-year-olds' percent attention to child programming was significantly higher than that to child commercials ($t = 5.298$, $df = 7$, $p < .001$) but the same was not true for adult content ($t = -.516$, $df = 7$, $p > .310$). The pattern for the seven/eight-year-old children was similar (child content $t = 9.057$, $df = 7$, $p < .001$) except that the difference for adult-oriented material was large enough that it began to approach significance ($t = 1.792$, $df = 7$, $p > .059$).

Two-year-olds showed no tendency to elevate or depress attention to commercials, regardless of the segment's intended audience. Exactly the opposite was true of eleven/twelve-year-olds. Attention to advertising for this

group was depressed relative to programming for both adult ($t = 3.342$, $df = 7$, $p < .006$) and child content ($t = 3.583$, $df = 7$, $p < .005$).

In sum, though tests of some of the percent attention predictions failed to reach statistical significance, the trends almost without exception conformed to expected patterns. As a whole, then, it can be said that the percent attention analyses were supportive of the hypothesis that with age children increasingly choose not to look at television advertising. Moreover, such selective avoidance develops first within the context of child content. It does not appear to be well-established for adult-oriented broadcast material until age eleven or twelve.

Exit Rate Analyses

As noted in the Introduction section of this paper, predictions for the exiting analyses were directly parallel to those made for the percent attention results. Anywhere that levels of attention were expected to be low, exiting rates were expected to be high. Thus, specific predictions were not repeated below except where necessary. The reader is referred to the section of results immediately prior (i.e. results for percent attention) for brief descriptions of the specific predictions. As in the percent attention analyses a 2 (viewer age) by 2 (sex) by 2 (intended

audience) by 2 (segment type) mixed model repeated measures ANOVA was calculated for the exit rate data. Table 8 presents, by age, the mean number of exits per hour of adult and child programming and advertising which resulted when all ad blocks and educbits were treated as commercial segments.

Children exited the viewing room with great frequency. For the sample as a whole, they averaged 9.37 exits per hour of exposure to television. The individual age groups averaged (in order, by increasing age) 12.73, 7.03, 8.62 and 9.48 exits per hour of television exposure. Unlike the percent attention data, the test for a main effect of age was not significant ($F(3,24) = 1.875$, $MSE = 122.64$, $p > .160$). The pattern of group means most resembled that which was obtained for hours of exposure to television. As was found there, the difference between age two and five was significant ($t' = 2.70$, $df = 12$, $p < .009$). Five-year-olds exited the room at significantly lower rates than the two-year-old group. None of the other pairwise comparisons were significant. The test for a quadratic factor in the pattern of exiting plotted as a function of age approached significance ($F(1,24) = 4.87$, $MSE = 19.632$, $p < .03$). Thus, the jump in percent attention and time in the room with TV between ages two and five was accompanied by a significant decrease in the probability of exiting the room

during any given interval of content, and there was some tendency for exit rate to increase again by eleven or twelve years of age.

Table 9 presents the mean number of exits per hour of adult and child content of any type, by age. Averages for the sample as a whole were 9.497 and 10.350 exits per hour of exposure to child and adult content, respectively. Although the percent attention results indicated that children, in general, looked more at child than adult content, there was no main effect of intended audience ($F(1,24) = 3.841$, $MSE = 40.194$, $p > .340$). There was, however, a significant viewer age by intended audience interaction ($F(3,24) = 3.841$, $MSE = 40.194$, $p < .022$). The Brown-Forsythe test for an age effect on average difference scores (child content rate - adult content rate) was significant as well ($F(3,30) = 3.834$, $MSE = 80.625$, $p < .025$). The average difference scores, in order by increasing age, were 0.960, -3.277, -4.375, and 3.279.

The two-year-olds showed no differentiation in frequency of exiting per hour of adult versus child content. The five-year-olds, on the other hand, exited the room slightly more frequently during segments aimed at adults than they did during those aimed at child audiences ($t = -2.316$, $df = 7$, $p < .027$). This difference was not significant at the one percent alpha level required by the

Bonferroni procedure. In fact, only the seven- and eight-year-olds' exiting rates for child and adult content differed significantly when this criterion was used ($t = -4.421$, $df = 7$, $p < .002$). They were more likely to exit the room during any given interval of adult as opposed to child content. It appears that this pattern begins to reverse by age eleven or twelve. The oldest group's average difference score was positive and approached significance ($t = 1.944$, $df = 7$, $p < .047$).

Taken together, the intended audience effects appear to follow a curvilinear pattern when plotted as a function of age. The test using quadratic contrast weights on the age effect for difference scores supported this assertion ($F(1,24) = 9.504$, $MSE = 29.762$, $p < .005$). Thus, there appear to be two age-related shifts in the rate at which children exit the viewing room. The first is a change from exiting being equally frequent during adult and child material to a distinct tendency to remain in the room for longer periods of time when child content is being broadcast. This change appears to occur gradually as a function of age. Moreover, the preference for staying in the room with child content appears to peak at age seven or eight, after which adult content appears to gradually gain in its ability to keep the viewer in the room for longer periods of time.

The test for a main effect of segment type was significant ($F(1,24) = 17.821$, $MSE = 3.126$, $p < .001$). As can be seen in Table 10, children exited the room more frequently per hour of advertising than programming. The mean exit rates for the sample as a whole were 8.765 exits per hour of shows and 12.687 per hour of commercials.

The pattern of mean exit rates presented in Table 10 suggests that this effect varies with age in a pattern consistent with our predictions. Namely, that the difference in exit rates during commercials and programming increases with age and is non-existent in the two-year-old group. It was surprising to find, then, that the test for an interaction between viewer age and segment type only approached significance ($F(3,24) = 2.638$, $MSE = 31.326$, $p < .073$).

Despite this result, tests of the contrasts of interest were performed. As predicted, the two-year-olds showed no differentiation in exiting rate as a function of whether an ad block or program segment was being aired. Five-year-olds ($t = -5.875$, $df = 7$, $p < .001$), seven/eight-year-olds ($t = -83.09$, $df = 7$, $p < .001$) and eleven/twelve-year-olds ($t = -4.575$, $df = 7$, $p < .002$) all left the room more per hour of commercials than programming. The result for five-year-olds was somewhat startling, as the same effect was only marginal for percent attention. The

expected linear increase in the magnitude of program versus ad block exit rates, as a function of age, was confirmed ($F(1,24) = 9.455$, $MSE = 15.396$, $p < .005$). The decision to selectively avoid advertising (as opposed to programming) by timing exits to occur within ad blocks does increase with age.

While the segment type by age of intended audience was significant for the percent attention data, the same was not true for exiting rates ($F(1,24) = .168$, $MSE = 25.796$, $p > .343$). Moreover, while there was some evidence in the attention data that selectively avoiding ads by not looking at them arose at an earlier age for child content, the exiting data were somewhat less convincing.

Table 11 presents the average segment type difference in exit rates (i.e. program rate - ad block rate) for child and adult content by age. Like the percent attention results, the test for a three way interaction between viewer age, age of intended audience and segment type was not significant ($F(3,24) = 1.992$, $MSE = 25.796$, $p > .142$). Also like the attention data, the two-year-olds' and five-year-olds' rate of exiting for ads was not elevated relative to programming if the ads occurred during broadcasts intended for adults. Unlike the attention data, however, the average ad versus programming difference for child content only approached significance for the five-

year-old group ($t = -2.015$, $df = 7$, $p < .042$). Also contrary to the percent attention data, the eleven/twelve-year-olds' average difference score also failed to reach significance when the Bonferroni procedure was used ($t = -2.64$, $df = 7$, $p < .017$).

In sum, the pattern of results for the exiting data clearly supported the central contention of this thesis. Namely, that with age children would increasingly choose to time their exits from the viewing room to occur during advertisement blocks. Other more specific predictions involving the intended audience factor and its interactions with both viewer age and segment type effects received less support. More often than not non-significant results for predicted effects were in the expected direction. This suggests that had the current study included more subjects per cell, or perhaps additional older age groups the expected effects might have been obtained.

Table 1

Mean Hours of Exposure per Week by Age[a]

	Age in years			
	2	5	7/8	11/12
Child Programs	3.555 (2.327)	7.839 (4.447)	5.614 (1.908)	2.322 (1.384)
Ads	0.497 (0.395)	1.221 (0.682)	0.974 (0.350)	0.448 (0.278)
Educbits	0.081 (0.104)	0.163 (0.121)	0.068 (0.068)	0.042 (0.041)
Content (all types)	4.133 (2.679)	9.222 (5.062)	6.656 (2.183)	2.812 (1.682)
Adult Programs	4.387 (3.413)	7.407 (5.627)	5.231 (3.243)	7.097 (2.685)
Ads	1.026 (0.876)	1.760 (1.376)	1.049 (0.708)	1.270 (0.343)
Educbits	0.021 (0.020)	0.060 (0.052)	0.019 (0.018)	0.032 (0.022)
Content (all types)	5.434 (4.260)	9.228 (9.025)	6.299 (3.956)	8.398 (2.993)
Total Programs	7.958 (5.054)	15.611 (7.524)	10.938 (3.340)	9.423 (3.160)
Ads	1.591 (1.274)	3.113 (1.615)	2.120 (0.766)	1.779 (0.532)
Educbits	0.106 (0.108)	0.235 (0.124)	0.092 (0.075)	0.075 (0.042)
Content[b] (all types)	9.729 (6.437)	19.063 (9.034)	13.280 (4.151)	11.413 (3.629)

[a]Standard deviations in parentheses
All n's = 8
[b]Includes EUP/Channelscan

Table 2

Mean Percent Attention to Child and Adult Shows, Ads and Educbits by Age[a]

	Content Type					
	Child			Adult		
	Shows	Ads	Educbits	Shows	Ads	Educbits
Age 2	44.49 (27.56)	44.33 (26.94)	45.00 (29.82) n = 6	28.43 (19.66)	34.49 (20.69)	23.61 (28.90) n = 6
Age 5	75.71 (13.46)	66.83 (17.21)	47.70 (24.14)	50.22 (18.68)	53.40 (15.99)	45.05 (27.17) n = 6
Age 7/8	82.39 (7.07)	71.81 (7.83)	74.60 (24.08) n = 7	66.47 (17.02)	61.11 (14.75)	43.16 (30.70) n = 5
Age 11/12	80.48 (7.47)	67.75 (10.47)	68.73 (12.07) n = 5	69.97 (10.27)	58.69 (13.24)	37.42 (24.20) n = 7

[a]Standard deviations in parentheses
Except where noted, n = 8

Table 3

Mean Percent Attention to Mixed-age Ads and Educbits by Age[a]

	Segment Type			
	Child before/ Adult after		Adult before/ Child after	
	Ads	Educbits	Ads	Educbits
Age 2	61.98 (27.61) n = 4	4.96 (0.73) n = 2	45.19 (35.76) n = 6	
Age 5	54.96 (35.12) n = 7	32.62 (23.50) n = 4	64.81 (10.50) n = 5	30.95 (3.37) n = 2
Age 7/8	61.35 (21.83) n = 7	70.28 (47.69) n = 4	33.84 (30.59) n = 4	
Age 11/12	55.019 (22.75) n = 5	43.66 (00.00) n = 1	63.23 (54.12) n = 3	

[a]Standard deviations in parentheses

Table 4

Mean Percent Attention to Adult and Child Programs and Commercials by Age[a]

	Segment Type			
	Child Audience		Adult Audience	
	Programs	Ad Blocks	Programs	Ad Blocks
Age 2	44.49 (27.56)	43.27 (26.75)	28.43 (19.66)	34.32 (20.74)
Age 5	75.71 (13.46)	65.11 (17.47)	50.22 (18.68)	52.58 (16.17)
Age 7/8	82.39 (7.07)	71.47 (8.42)	66.47 (17.02)	60.95 (14.84)
Age 11/12	80.48 (7.47)	66.88 (10.68)	69.97 (10.27)	58.06 (13.38)

[a]Standard deviations in parentheses
All n's = 8

Table 5

Mean Percent Attention
to All Types of Child and Adult Content
by Age[a]

	Segment Type	
	Child Audience	Adult Audience
Age 2	44.39 (27.47)	29.71 (19.06)
Age 5	74.06 (13.96)	50.74 (17.52)
Age 7/8	80.70 (7.06)	65.55 (16.22)
Age 11/12	78.08 (7.79)	67.98 (10.42)

Table 6

Mean Percent Attention to Programming and Advertising
Intended for Any Audience
by Age[a]

	Programs	Ad Blocks
Age 2	35.20 (22.08)	37.81 (21.31)
Age 5	62.77 (12.95)	56.79 (17.14)
Age 7/8	74.16 (12.34)	65.11 (11.21)
Age 11/12	73.41 (8.16)	61.64 (10.48)

[a]Standard deviations in parentheses
All n's = 8

Table 7

Mean Difference In Percent Attention to Programming and Advertising[a]

	Intended Audience	
	Child	Adult
Age 2	1.21 (5.16)	- 5.88 (12.76)
Age 5	5.30 (5.66)	- 2.36 (12.94)
Age 7/8	9.06 (3.41)	5.53 (8.72)
Age 11/12	13.60 (7.03)	11.91 (10.08)

[a]Standard deviations in parentheses
All n's = 8

Table 8

Average Number of Exits per Hour of Exposure to Child and Adult Programming and Ads by Age[a]

	Segment Type			
	Child Audience		Adult Audience	
	Programs	Ad Blocks	Programs	Ad Blocks
Age 2	14.58 (9.18)	12.10 (11.59)	12.66 (4.00)	16.70 (7.57)
Age 5	5.32 (2.50)	7.56 (3.26)	8.31 (5.58)	11.54 (7.20)
Age 7/8	5.60 (0.83)	9.88 (2.69)	9.66 (3.17)	15.22 (4.35)
Age 11/12	10.03 (8.74)	21.23 (18.51)	7.79 (5.75)	13.14 (6.32)

[a]Standard deviations in parentheses
All n's = 8

Table 9

Average Number of Exits per Hour of Exposure to All Types of Child and Adult Content by Age[a]

	Segment Type	
	Child Audience	Adult Audience
Age 2	14.21 (8.70)	13.25 (3.15)
Age 5	5.67 (2.31)	8.95 (5.48)
Age 7/8	6.22 (0.86)	10.59 (3.06)
Age 11/12	11.89 (10.07)	8.61 (5.75)

Table 10

Average Number of Exits per Hour of Exposure to All Types of Programming and Advertising by Age[a]

	Programs	Ad Blocks
Age 2	12.72 (5.58)	13.76 (5.20)
Age 5	6.49 (3.20)	9.46 (3.81)
Age 7/8	7.45 (1.53)	12.40 (2.50)
Age 11/12	8.40 (6.81)	15.14 (15.14)

[a]Standard deviations in parentheses
All n's = 8

Table 11

Mean Difference in Exits per Hour of Ads and Programs for Adult and Child Content by Age[a]

	Intended Audience	
	Child	Adult
Age 2	2.48 (12.01)	- 4.04 (9.22)
Age 5	- 2.24 (3.14)	- 3.23 (5.61)
Age 7/8	- 4.28 (2.39)	5.56 (3.57)
Age 11/12	-11.20 (12.00)	- 5.35 (3.15)

[a]Standard deviations in parentheses
All n's = 8

CHAPTER 4

DISCUSSION AND CONCLUSIONS

Prior research suggests that children's attitudes towards commercials become increasingly negative with age, and that this reflects their growing awareness of the purpose and likely credibility of advertising content. Specifically, the literature examining children's understanding of and attitudes towards commercials tells us that most preschool children can distinguish between commercials and program segments (Butter, Popovich, Stackhouse & Garner, 1981; Donohue et al., 1980; Levin et al., 1982; Palmer & McDowell, 1979). In addition, a minority of those children may recognize that commercials are about things you can purchase. By first grade, approximately fifty percent of children are aware of this concept but only a small minority can articulate that advertising messages are often biased. By third grade the understanding that commercials are often not credible is understood by most children, and their attitudes towards advertising reflect this. Testing of even older children suggests that almost all are cynical towards commercials by age ten or eleven (Robertson & Rossiter, 1974; Rossiter & Robertson, 1974; Ward et al., 1977). This study examined whether children's attention to advertising, as well as

their exiting from the viewing room, revealed the same pattern of age-related differences. Specifically, children's attention to commercials was compared with their attention to television programming. Rates of exiting the viewing room during these types of content were compared as well.

The results of the attention analyses indicated that age is an important factor in determining whether a child's attention to advertising is significantly depressed relative to attention during program content. Specifically, while five-year-olds' attention to commercials was slightly lower than their attention to surrounding programming, the difference was not significant. Seven- and eight-year-olds, however, clearly preferred program content and the difference was even greater in the eleven- and twelve-year-old group (see Figure 1). Thus, the extent to which attention was depressed in the presence of advertising increased linearly as a function of age.

Rates of exiting the viewing room followed the same pattern (see Figure 2). Children exited the room more per hour of commercials than they did per hour of program content. Moreover, the extent to which this was the case increased linearly as a function of age. The only difference in the pattern of results for the attention and exiting analyses was the fact that even the five-year-olds

exited the room more per hour of commercials than program content. These results closely follow the pattern of age-related differences in children's understanding of, and attitudes toward television advertising. The youngest group to consistently prefer programming was the seven- and eight-year-old, which is the same age at which a majority of children express a distrust of commercial messages.

Children as young as two years old have not been included in prior research. It has been anecdotally reported by parents, however, that commercials are the first type of content that their children consistently attend. In addition, Alwitt et al. (1980) reported that three-year-olds exhibited elevated levels of attention to television (in the laboratory) when commercials were being aired. Both of these reports could be construed as support of the reflexive theory of children's attention to the television. In other words, because commercials make especially frequent use of television's special non-content features, very young children's attention is reflexively drawn to the TV.

The two-year-olds who were observed in the current study, however, paid consistently low attention to both programming and advertisements (approximately 36 percent). Moreover, they left the room no more frequently per hour of either content type. This is consistent with a comprehensibility account of children's attention to

television. Two-year-olds pay no more attention to ads than program segments because neither offers much that is comprehensible to them. Why then do parents report such an effect? It seems at least possible that because parents are watching the television themselves during program segments, they fail to observe those instances when their child is looking as well. Thus, their impression is that their child only looks at commercials. An explanation of Alwitt et al.'s (1980) finding, on the other hand, may reside in the particular selection of commercials included in their study. The reader will recall that three-year-olds in this study also paid significantly more attention when lively music occurred. Thus, it is possible that the commercials on the stimulus tapes had more lively music than the program segments that were included.

Alwitt et al. (1980) also reported that four- and five-year-olds' attention was significantly depressed during commercial segments relative to attention during program segments. Data from the current study suggest that this result would not have been obtained had these children been viewing adult programming. As can be seen in Figure 3, five-year-olds' attention to commercials was significantly lower than attention to program content only when child-oriented programming was being viewed. The same was true of the seven- and eight-year-old group, though the difference

in their attention to advertising and program content approached significance in the context of adult programming. A result similar to this was reported by Ward et al. (1972) when they compared relative levels of attention to commercials and programs during Saturday morning and weekday evening viewing.

It cannot be said with certainty why children would first begin to depress their attention to commercials within the context of child-oriented programming. One possibility is suggested by Atkin's (1975a,b) observations and interviews with children in this age group. When interviewed, these children report being irritated by the fact that commercials interrupt the program they are viewing. In addition, when they were observed while viewing child-oriented programming in the laboratory their irritation was obvious. This irritation when commercials occur, then, may cause these children to look away and perhaps engage in other activities in the room. The same effect would not occur within the context of viewing adult programs as their attention to this type of content is significantly lower, i.e. their interest in the on-going program is not as high.

Another possible explanation is that some of the commercials that occur during child-oriented programming may not be specifically intended for a child audience. If so,

these commercials may be less comprehensible (at least to five-year-olds), and therefore they fail to maintain the child's interest. Alwitt et al. (1980) included ads intended for both children and adults in their stimulus tapes. Although they report that attention was generally higher to the child-oriented ads, it is not clear whether the tendency to depress attention in the presence of commercials held for these commercials alone.

At least two other possibilities could explain this effect as well. First, because children's attention to the television is so high in the context of children's programming, the commercials that are aired during that time may be highly familiar and therefore less interesting than the program content (five-year-olds averaged almost 76 percent attention, the seven-eight-year-olds averaged 82 percent). Finally, it is possible that this effect reflects the beginning of the development of children's awareness of the purpose and likely credibility of advertising. As noted in the introduction to this paper, when asked how they know why ads are not always truthful, most children report that it is based on personal experience with products they saw advertised on TV (Rossiter & Robertson, 1974; Ward et al., 1977). Clearly, this is most likely to occur for products advertised during children's programming.

In sum, the results of this study suggest that the appeal of television advertising decreases with age. This is evident in both the relative level of attention that advertising receives (as compared to programming) as well as when children time their exits from the viewing room. In addition, the pattern of age differences in these behaviors suggests that children's responses to advertising are in part determined by their level of the awareness of its purpose and likely credibility.

This study has raised a number of interesting questions for future research. For example, why is it that children first selectively avoid commercials within the context of children's programming (see Figures 3 and 4). The possibility was raised that these blocks of commercials may contain advertisements not intended for this audience. Future research should examine this question by coding the intended audience of an ad based on the ad itself and not the intended audience of surrounding programming as was done here.

In addition, the analysis of exiting behavior suggests that children begin to leave the room more often per hour of advertising than programming before they begin to depress their level of attention to commercials. It is possible that this reflects a tendency for young children to follow older coviewers out of the room. This, too, could be

clarified by future research. Moreover, this study found that despite the fact that eleven- twelve-year-old children were timing their exits to occur during commercial blocks, their total time in the room with advertising was not significantly less than that for the younger groups. It was suggested that this may have been due to the small number of subjects included in this study and that the addition of older age groups might prove this trend to eventually result in less total exposure to advertising content. Future analyses will examine whether the amount of advertising that was missed as a result of leaving the room increases with age.

It should be noted that while children may increasingly opt to look away from the television, or leave the room, when advertising is being aired, attention to advertising increased with age, just as attention to programming did. In both cases the differences between age groups followed a pattern consistent with a comprehensibility account of attention to television in general. Finally, although even five-year-olds prefer child-oriented programming to the commercials that interrupt it, their attention to those commercials is substantial (mean 65 percent). Moreover, estimates from these data suggest that five-year-old children (the heaviest viewers in this sample) were exposed to approximately 162 hours of advertising per year. As the

cognitive skills necessary to critically evaluate commercial messages are not well-established in this group, the potential for deleterious effects on children is still considerable.

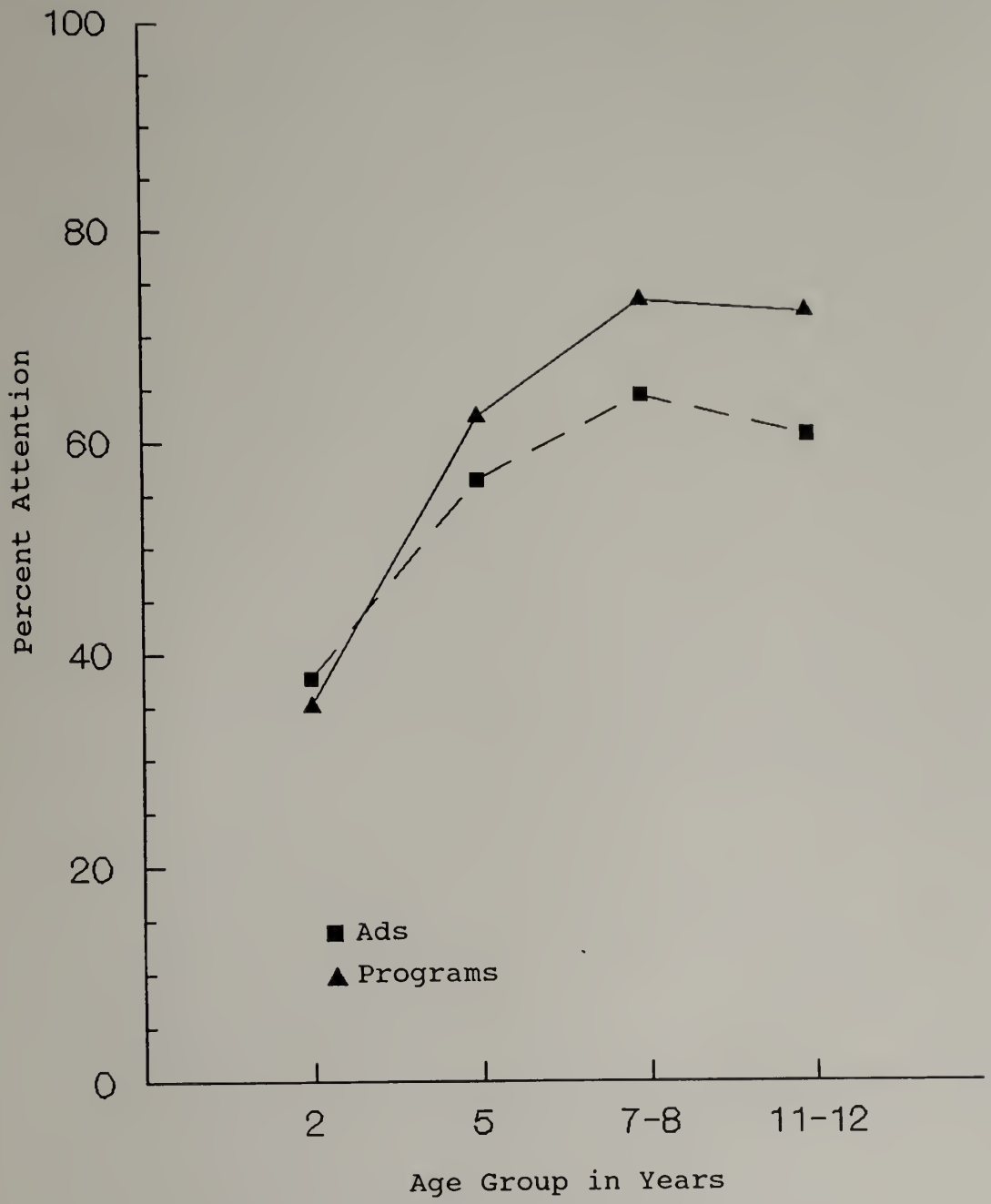

Figure 1. Attention to Advertising versus Program Content as a Function of Age

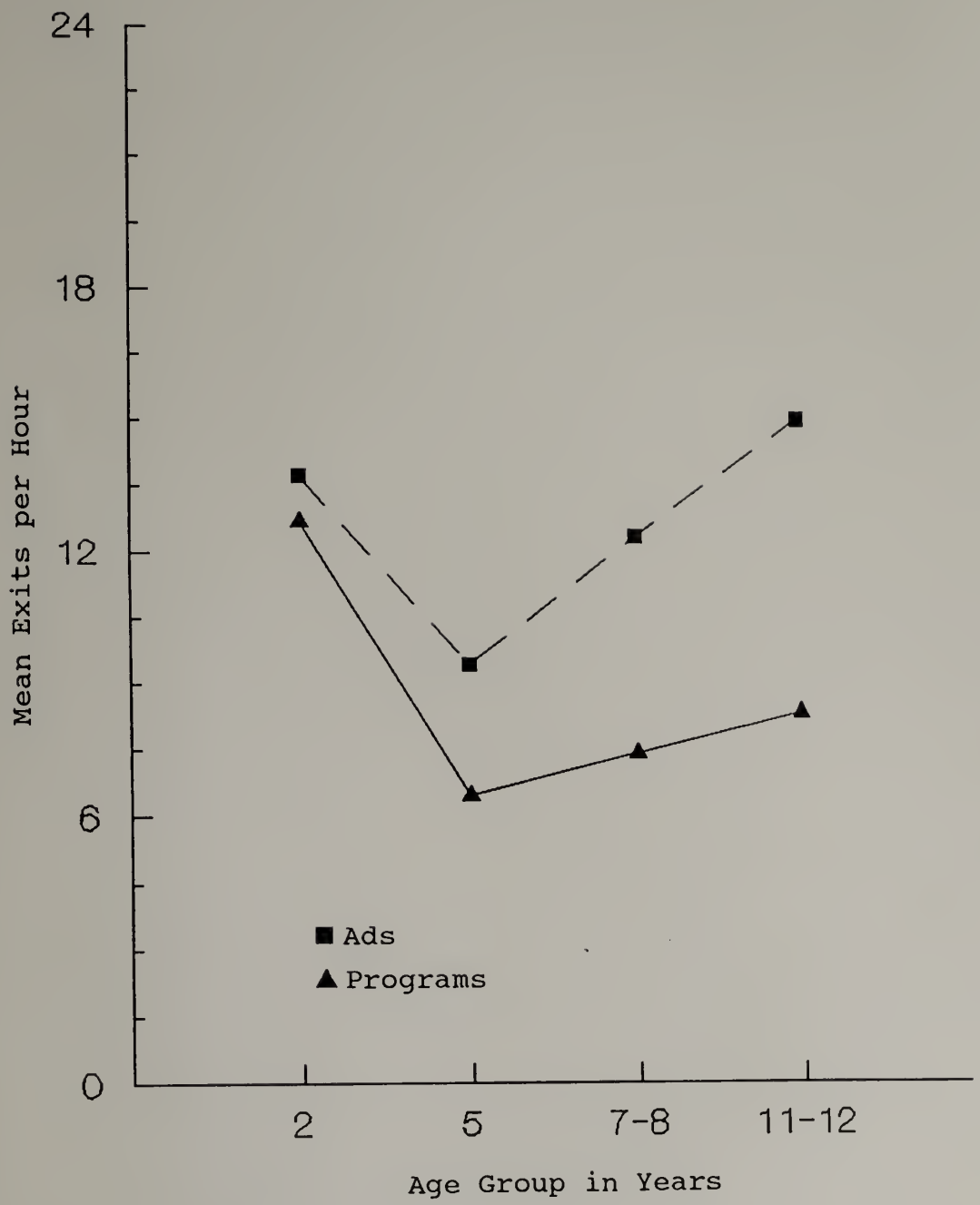

Figure 2. Mean Exits per Hour of Exposure to Advertising versus Program Content as a Function of Age

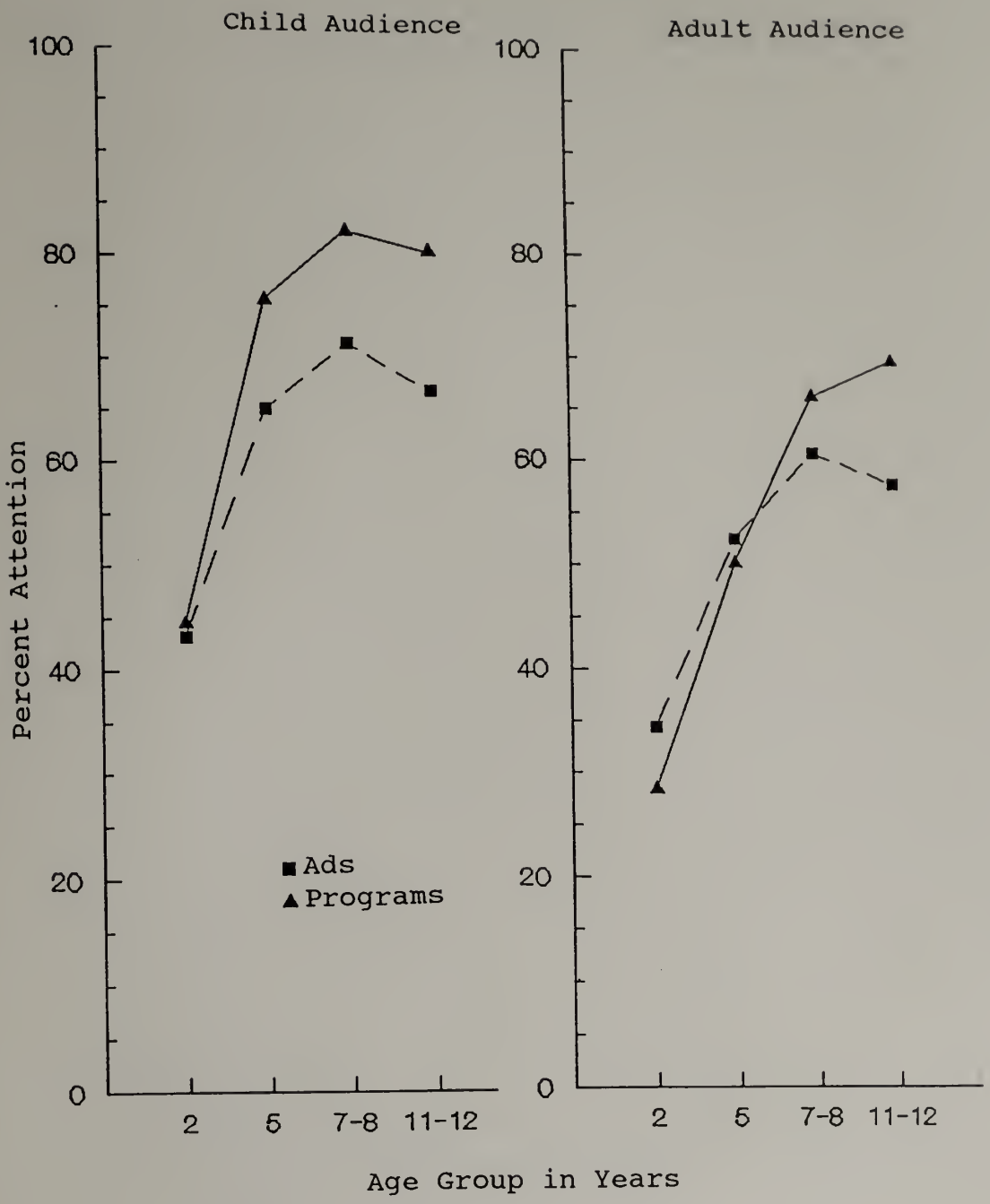

Figure 3. Attention to Advertising versus Program Content Intended for Child and Adult Audiences as a Function of Age

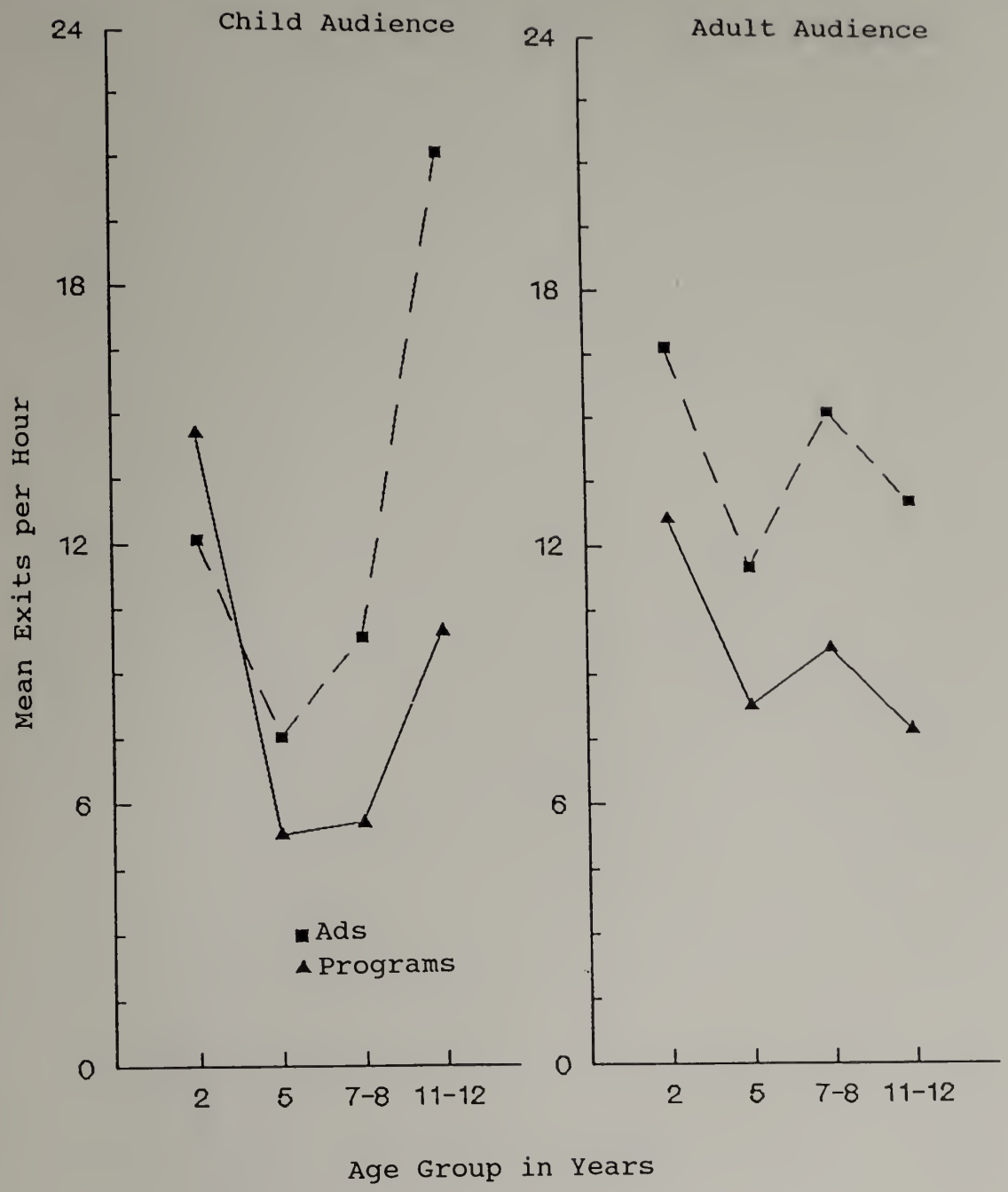

Figure 4. Mean Exits per Hour of Exposure to Advertising versus Program Content Intended for Child and Adult Audiences as a Function of Age

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